

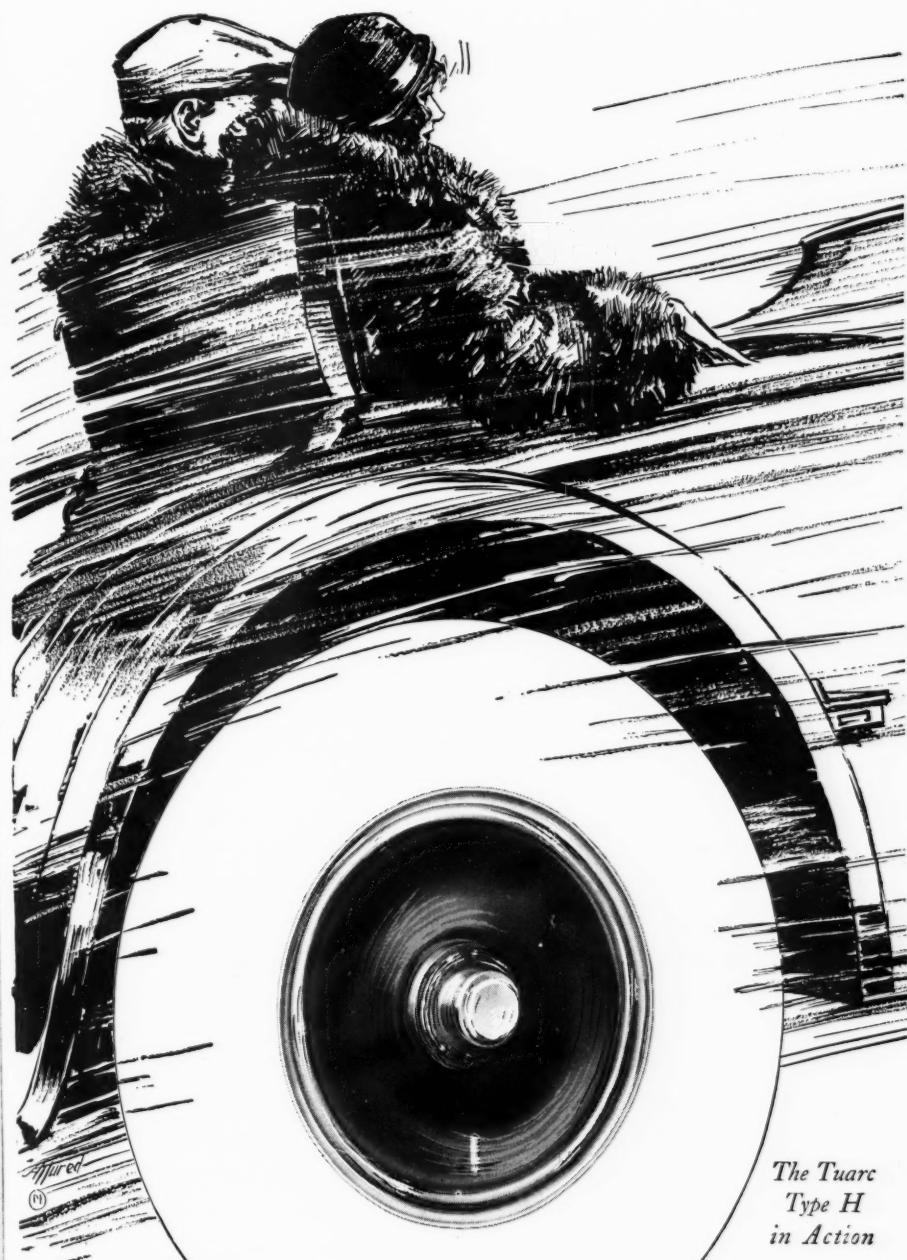
In This Issue—*Save Tires and Reduce Rubber Prices*

MOTOR AGE

Vol. XLVIII
Number 27

PUBLISHED WEEKLY AT 5 SOUTH WABASH AVENUE
CHICAGO, DECEMBER 31, 1925

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Three Dollars a Year



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Mechanical perfection and complete utility are rarely combined in a form that is so beautiful as the Tuarc Type H steel wheel.

Steel strength, highest convenience in mounting or inflating tires, consistent lightness, and complete silence are embodied in simple curves which flow nicely into the contour of balloon tires.

The impression this wheel makes capitalizes the fact that it is the first moving part of a car to be seen. The construction of the Tuarc Type H makes it about the last moving part which ever needs to be seen to.

MOTOR WHEEL
CORPORATION
LANSING, MICHIGAN

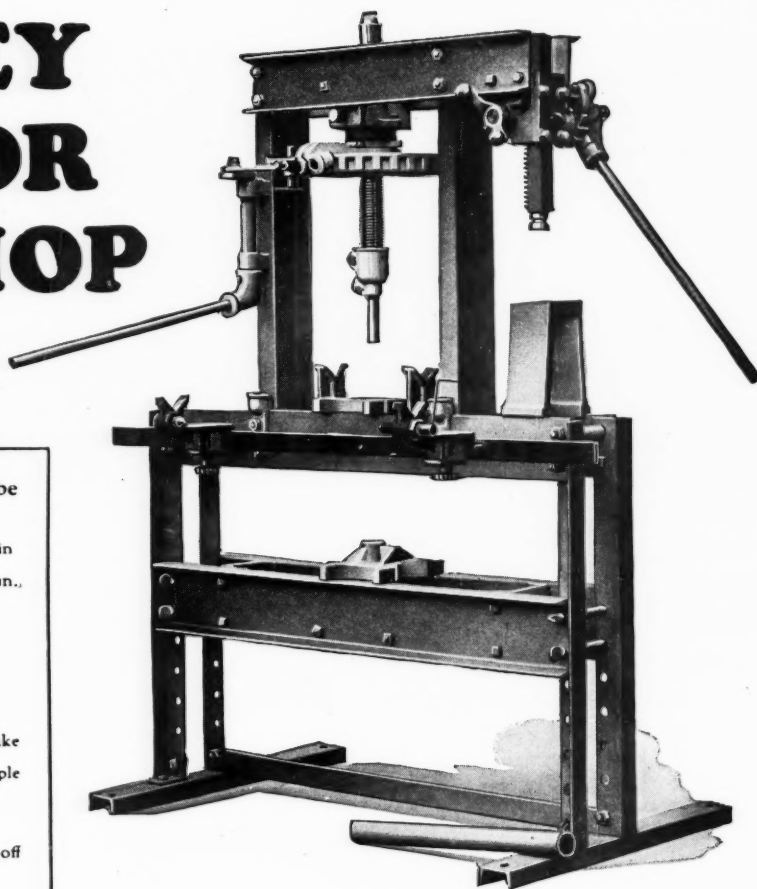
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Type H
in Action*

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A MANLEY PRESS FOR EVERY SHOP

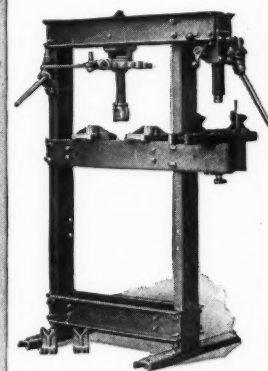


21 Operations on the Ford car that can be performed with a Manley Press

1. Pressing steering spindle body bushings out and in.
2. Pressing steering arm bushings out and in.
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4. Straightening steering drag link.
5. Straightening front axle.
6. Pressing wheel hubs out and in wheel.
7. Pressing timing gear off and on camshaft.
8. Pressing timing gear off and on crankshaft.
9. Pressing gear off and on generator.
10. Straightening camshaft.
11. Straightening crankshaft.
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13. Pressing bushings out and in transmission brake drums.
14. Pressing bushings out and in transmission triple gears.
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16. Straightening rear axle shafts.
17. Straightening rear axle shaft housing.
18. Pressing drive shaft pinion roller bearing sleeve off and on.
19. Straightening drive shaft.
20. Straightening drive shaft housing.
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1. Excess capacity: Manley ratings are very conservative and all Manley equipment has a much greater capacity than the Manley ratings indicate.
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5. Double table saves time adjusting table for work of different heights, long nose and short nose supplied with Press, this also saves time adjusting for height.
6. High speed Rack and Pinion Press Attachment. Two men can work on this Press at the same time.
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8. Hand levers in most convenient position, enabling operator to keep eyes on work.
9. Quick change of leverages and speeds.
10. Correctly lubricated.
11. Designed by R. E. Manley and guaranteed by The Manley Mfg. Co.
12. Price \$100.00 without Rack and Pinion Press or Crankshaft Straightening Attachment. With Rack and Pinion Press and Crankshaft Straightening Attachment \$145.00.




For the smaller shops the 20 Ton Manley Press is recommended; complete with Rack and Pinion Press and Crank-shaft Straightening Attachment \$104.00.

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Buy from your
own jobber.

The **BUICK** *Franchise means* **Security**



Sound factory backing—great public good will—a line of motor cars that salesmen can make good money selling—G M A C wholesale and retail financing, with lowest time payment rates—these are only a few of the advantages which guarantee profits to Buick dealers.

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the Better **BUICK**

BUICK MOTOR COMPANY, FLINT, MICHIGAN

Division of General Motors Corporation

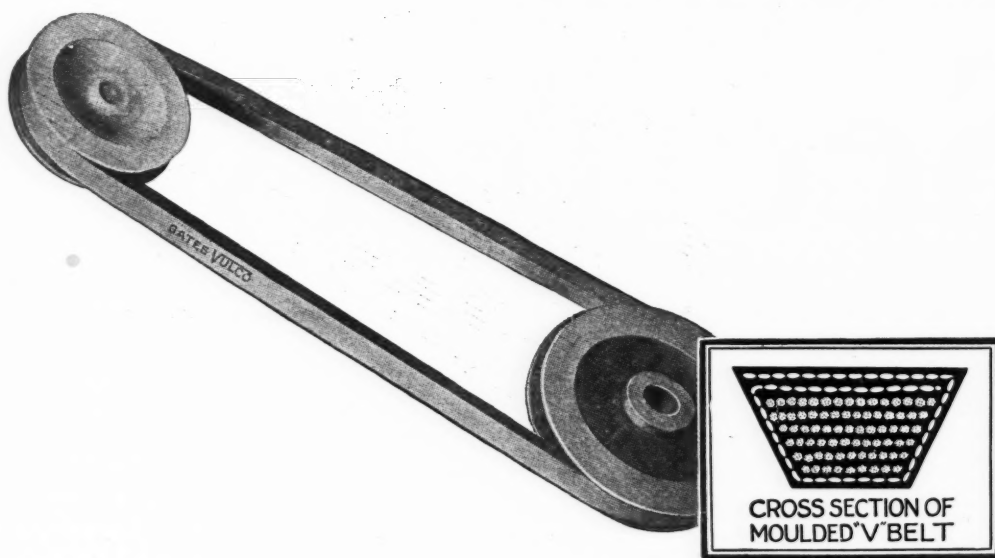
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"The Standardized Fan Belt"



90 to 100 cords encased in rubber—exactly the same cords and the same construction that go into a cord tire—that's why Gates Vulco V-Belts have solved the V-Belt problem.

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MOTOR AGE

Reg. U. S. Pat. Office

Vol. XLVIII

No. 27

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When You Sell
SE-MENT-OL
Reg. U. S. Pat. Off.

You are selling a commodity that has stood first in the minds of motorists for fifteen years.

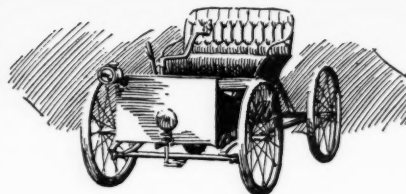
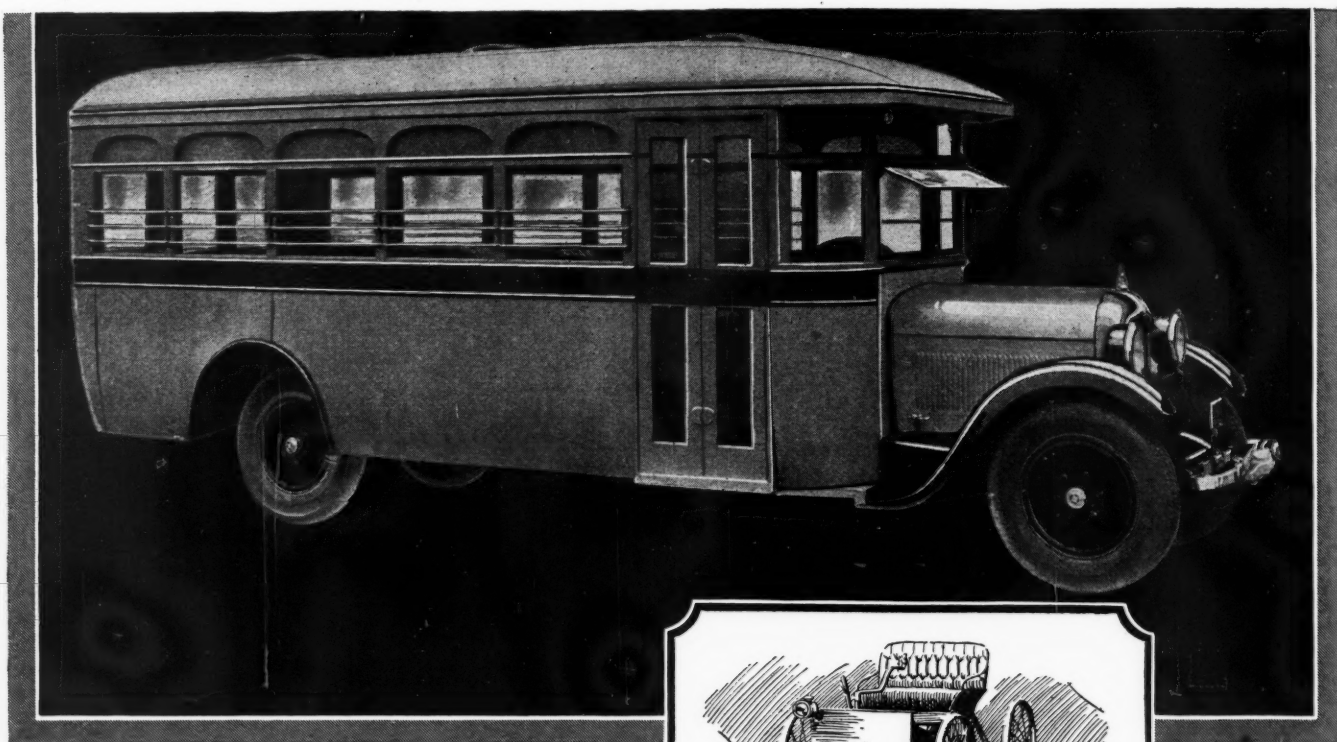
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THE Chemically Correct Line
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RADIATOR CEMENT

BACKED BY 35 YEARS OF "KNOW-HOW"



13 Years Before the First Ford

Since 1890—35 years ago—Miller has been building *dependable* vehicles; adopting new ideas, but clinging always to the good old ideals—honest workmanship and sincere service.



Popularity

There is just one test for any product, and that is—DEMAND.

The ripple of applause that greeted the pioneer Miller Bus has become a thundering endorsement that will not down.

Miller Busses dot the highways from coast

to coast, and back again. And still the orders come piling in! Many from distant ports, too. For the news of Miller *proved performance* has spread half-a-world away. Two great factories are hard put to keep delivery schedules. What better proof of merit than this evidence of enduring prosperity!

(Write today for detailed specifications, and some mighty interesting facts and figures.)

The A. J. MILLER CO., BELLEFONTAINE, O.

How Studebaker Sells the Public on the Dealer as well as on the Car

THE SATURDAY EVENING POST

January 2, 1926

Your Wife may buy a Used Car with Perfect Safety

—The Studebaker Used-Car Pledge certifies Value and Price

YOUR wife patronizes the store whose policy of square dealing is a matter of certainty. There she buys with absolute confidence. She may buy a Used Car with equal confidence under the policy outlined in the Studebaker Used-Car Pledge. For expert knowledge of Used-Car values is not necessary to secure honest treatment, where this Pledge is displayed.

Studebaker has brought to the business of selling Used Cars the same measure of integrity and square dealing expressed by Wanamaker in this statement:

From haggles and barter	— to fixed fair prices.
From tricks of the trade	— to open square dealing.
From the customer beware	— to the customer be satisfied.
From obscure price marks	— to accurate price marking.
From advertising bombast	— to accuracy in word and print.

Guided by this same policy, as expressed in the Studebaker Used-Car Pledge, the Studebaker dealer who sells you a used car has, as his first and biggest objective—your confidence. Therefore, he does not simply sell you a Used Car, arbitrarily priced for profit. He sells you "unused mileage," honestly priced to make you a friend of Studebaker.

Your Studebaker dealer is essentially a merchant in new cars. The solid business foundation upon which the Studebaker Corporation has progressed for 73 years, has actuated the policies under which he sells—whether fine One-Profit Studebakers, or used cars of any make.

Read this Pledge and you will understand why common sense guides the careful buyer, of either a new or used car, to the showroom of a Studebaker Dealer.

Pledge to the Public on Used Car Sales

1 All used cars offered to the public shall be honestly represented.

If a car is suitable only for a purchaser who can rebuild it, or for some one who cannot care a cent whether it is a running car, it must be sold on that basis. Each car must be sold for what it is.

2 All Studebaker automobiles which are sold as CERTIFIED CARS have been properly reconditioned, and carry a 30-day guarantee for replacement of defective parts and free service on adjustments.

This is possible because intermediate service mileage has been built into every new Studebaker, which is its invariable advantage to you.

3 Every used car is conspicuously marked with its price in plain figures, and that price, just as the price of our new cars, is rigidly maintained.

The public can deal in confidence and safety only with the dealer whose policy is "one price only—the same price to all." Any one will come on this basis, every one of them, who is honestly going to begin with.

4 Every purchaser of a used car may drive it for five days, and then, if not satisfied for any reason, turn it back and apply the money paid as a credit on the purchase of any other car in stock—new or used.

It is assumed, of course, that the car has not been damaged by accident or other accident to the operation.

Not only to the public, but also to The Studebaker Corporation of America, whose cars we sell, we pledge adherence to the above policy in selling used cars.

By Yours Studebaker Dealer

Out of every eight cars sold for more than one thousand dollars—one is a Studebaker

This is because buyers have considered these facts:



1. Studebaker is the only One-Profit car in the quality field—the only car which has all bodies, all engines, all axles, all clutches, gear sets, springs, differentials, steering gears, gray-iron castings and drop forgings designed, engineered and manufactured by one organization. Therefore prices are down to bed rock.
2. Studebaker facilities make possible Unit-Built construction. Since the entire car is designed and built as a unit, it functions smoothly and yields scores of thousands of miles of excess transportation.
3. Studebaker's \$100,000,000 facilities enable us to keep cars constantly up-to-date. Changes are continually made, not saved up for annual announcements which make cars in the hands of owners artificially obsolete.
4. Purchasers may buy Studebaker cars out of income at the lowest time-payment rates known to the industry.
5. Studebaker cars are sold and serviced by a world-wide organization of responsible merchants.

T H I S I S A S T U D E B A K E R Y E A R



The Country Has Gone Nash

Nash Is Turning December Into June

Daily during this month, when ordinarily motor car sales are depressed, Nash has been receiving wires to rush shipments for immediate delivery.

Business has piled up at the factory at so rapid a rate that December, 1925, will again set a new high record for December production and sales and will eclipse December last year—the previous banner Nash December—by 50 to 60%.

And this month, too, will see Ajax round out the 11,000th car built and shipped since the start of production barely more than six months ago.

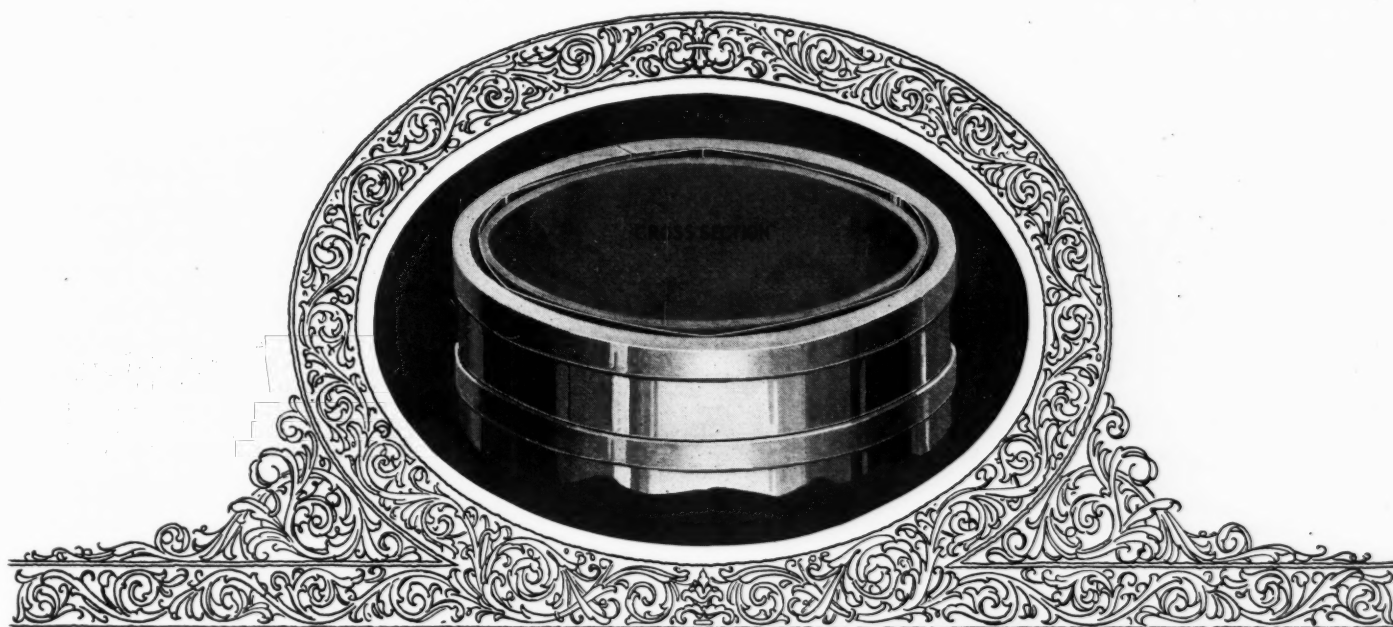
Today the man with the Nash-Ajax franchise is in an uniquely fortunate position.

With a wider market, greater price range, superior value, and rising sales, his monthly and yearly net are climbing to figures never before approximated in the history of the Company.

THE NASH MOTORS COMPANY, *Kenosha, Wis.*

NASH

(2696)



Prevent All Ailments from **"LEAKAGE OF THE HEART"** *in Motors You Repair*

OIL or gas that escapes past piston rings is like leakage of the heart. The piston rings (or valves in the heart of the motor) are not functioning properly. Result: Oil pumping, excessive oil consumption, piston slapping, lost compression, and other ailments.

Cure all such ailments with Ramco Inner Rings. And, in addition, make more money by preventing these troubles by putting Ramcos into every motor you tear down. Your customers will appreciate this ounce of prevention that will pay for itself over and over. Ramcos keep the piston centralized. They maintain the elasticity of the piston rings by cushioning the joint between rings and piston. And they equalize the tension of the rings. Let us send you a set of Ramcos for trial.

Order Ramcos from your jobber or write us.

RAMCO

Cushion

INNER RINGS

REG. U. S. PAT. OFF.

Ramsey Accessories Mfg. Corp.

St. Louis, Mo.

WALTER P. CHRYSLER

Motor Car Manufacturer

Announces

AS FINE
AS MONEY CAN BUILD
UTMOST LUXURY
FOR 2 to 7 PASSENGERS

92
HORSE-POWER

80
MILES PER HOUR

MOTOR AGE

Vol. XLVIII

Chicago, December 31, 1925

No. 27

Summary and Index of Important Events in

This Week's Automotive News

Detailed Stories from MOTOR AGE Staff Writers and Special Correspondents Appear in News Section Beginning on Page 32

CHRISTMAS campaigns greatly boost new and used car sales. Factories continue to lessen production with big volume in sight early in 1926. Page 32.

Peoria, Ill., association warns dealers against overstocking. Page 32.

Increased interest is being shown in trade days at national shows. Page 33.

Tire production is expected to set new record in December. Page 33.

Dodge Brothers sales are ahead of all 1924 by December 15. Page 34.

Parts and accessory trade closes the greatest year in its history, Motor and Accessory Manufacturers' Association says. Page 35.

F. B. Stearns Co. will retain its identity although business is purchased by Willys-Overland Co. Page 35.

Dow-Jones Company announces terms of merger between American Car, J. G. Brill, Fageol and Hall-Scott. Page 36.

Oakland Motor Car Co. closes sales year second only to boom period after war. Page 37.

Top production throughout the winter is assured by orders on hand at Cadillac factory. Page 37.

South Dakota Automobile Trades Association holds big annual convention in Aberdeen. Page 43.

Nash business in December expected to total 50 per cent better than same month last year. Page 39.

Conditions in South Africa indicate that 1926 will be prosperous year for automobile men. Page 39.

Louisiana reports sales have been unusually heavy in last three months. Page 36.

Show space allotted to exhibitors at 1926 Cincinnati automobile show. Page 38.

Ford engineers show plans for new dirigible to Coolidge. Page 38.

Demand for cars made in United States shows heavy increase in Mexico. Page 38.

Buffalo, N. Y., dealer uses "dog-eat-dog" system in salesmen's prospects. Page 43.

Next Week's MOTOR AGE—National Shows Issue and Specifications Number

Stretch Rubber to Lower Tire Prices



HERBERT HOOVER
Secretary of Commerce

A RUBBER conservation program along the lines suggested in an editorial in the Nov. 26 issue of *MOTOR AGE* has been undertaken under the leadership of Secretary of Commerce Herbert Hoover by leading business associations representing the various branches of the automotive industry.

It is hoped this conservation campaign will materially reduce the current demand for raw rubber and cause a break in the exorbitantly high prices being maintained by the British interests which practically control the world's supply of raw rubber.

Joined in this campaign are the National Automobile Chamber of Commerce, the Rubber Association of America, the National Automobile Dealers' Association and the American Automobile Association.

The keynote of the campaign is "Stretch Your Rubber." In other words, make your tires last longer. It is estimated by the N. A. C. C. that by proper care tires can be made to deliver 25 per cent more mileage than the average user has been accustomed to get from them.

This means tires must be properly serviced. They must be repaired when it is economical to do so. They must be supplied with the right kind of accessories to maintain them in best condition. Part of the money the users will save in stretching their tires over an increased mileage naturally will be spent for repairs, service and accessories. This will mean good business for the dealer who repairs tires and sells sundries used for the maintenance and protection of tires. At the same time the public and the industry will benefit if by this campaign the price of rubber can be brought down to a reasonable basis.

This unified fight against the British rubber monopoly was decided upon between representatives of the rubber and automobile industries and government officials, led by Secretary of Commerce Hoover, at Washington last week.

As the result of an all-day conference it was decided that automobile manufacturers will immediately launch an advertising campaign to "educate" rubber users to economize all possible in their wear on tires. Representatives of the National Automobile Chamber of Commerce announced that the members of that organization would carry the slogan: "Stretch Your Rubber," in all of their national advertising copy.

This phase of the campaign will be linked up with that of the American Automobile Association, which will im-

Department of Commerce Sponsors Unified Campaign on Part of American Automotive Industry to Combat High Prices Maintained by British Rubber Monopoly by Conservation of Tires in Service—Motor Age to Tell How Savings May Be Accomplished

In subsequent issues of *MOTOR AGE* specific suggestions will be given as to how dealers may cooperate in the rubber conservation campaign and at the same time increase their own business through the sale of repairs, accessories and sundries useful in making tires last longer.

mediately issue an appeal to the 18,000,000 motor vehicle users to economize in tires and to take better care of their tires. The public will be told how to save tires, and the 40,000 dealers and agents throughout the country will be called upon by the National Automobile Dealers' Association to further the campaign. The Rubber Association of

(Continued on page 34)

November 26, 1925

MOTOR AGE

EDITORIAL

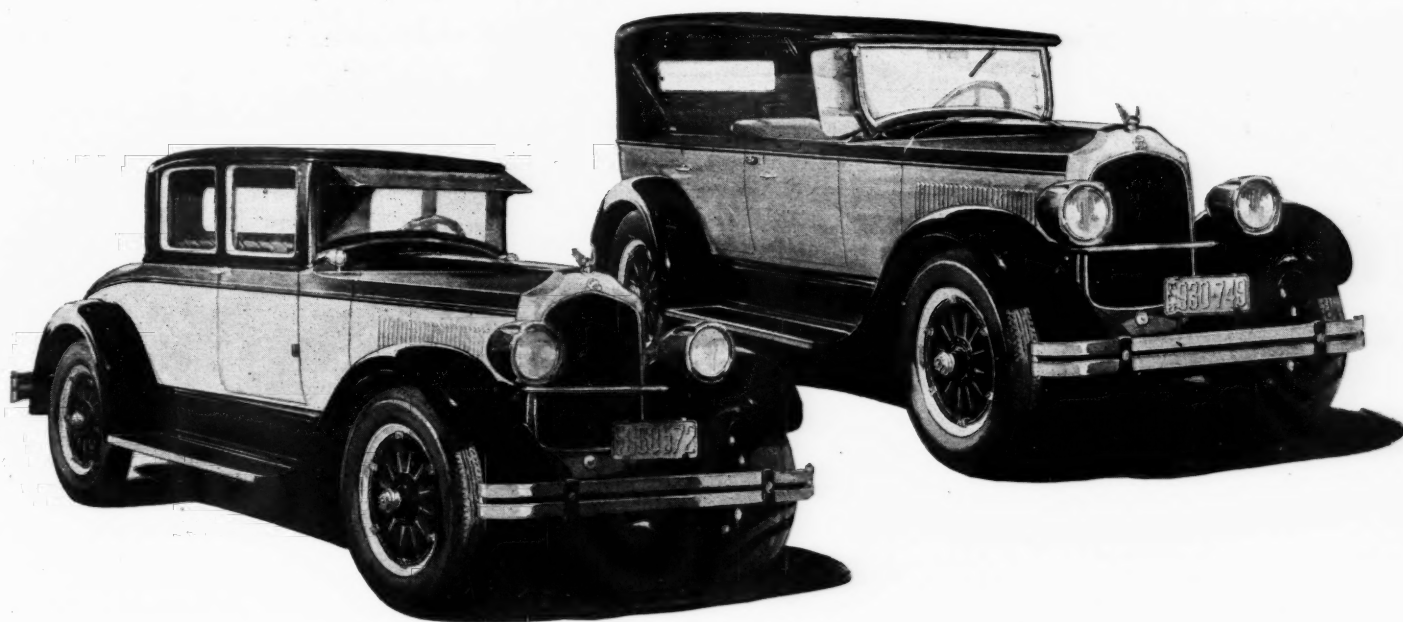
Tires in 1926

THE price of crude rubber remains high and the supply of the product is said to be inadequate. The British restriction policy at last has begun to restrict and from present indications the automobile industry will be confronted with a serious situation in regard to tires in 1926. American interests that have set out to grow their own rubber will not get into production on an appreciable scale for some years. Meanwhile it will pay the industry to do all in its power to conserve tires. Casings should not be too quickly discarded. An inexpensive repair frequently will greatly prolong the life of an otherwise good casing. A tube frequently is discarded as leaky when what is needed is a new valve core at a cost of about six cents. New flaps, boots and other accessories can be used to advantage in getting the utmost mileage out of tires. And drivers should be urged to use care in driving over rough roads so as not to unduly damage their tires. The hoarding of tires by consumers is not to be encouraged. It merely serves to increase the apparent shortage of the product and tends to drive prices upward. Conservation of tires will go a long way toward relieving any threatening crisis in the tire supply.

Just because 1926 promises to be a year of grand opportunity...

Reproduction of editorial in the Nov. 26 issue of *MOTOR AGE* urging conservation of tires as a means of combating the rubber restriction policy of British interests controlling the greater part of the supply of crude rubber.

High Speed Characterizes New and More Powerful Chrysler Six



Left: The new 4-passenger Chrysler coupe. The full-crowned fenders used on all models can be plainly seen; right: the 5-passenger phaeton showing the windshield wings which are standard equipment on both open cars. Instead of cowl lights the lights for parking are placed on the body near the rear door entrance.

Chassis Replete With Novel Features To Insure Good Performance at Low Speeds Also. New Body Lines Particularly on Radiator and Hood Give Striking Appearance to Car

By L. S. GILLETTE

WITH the embodying of striking new lines in a wide range of colorful bodies mounted on a low hung 90 h.p. six cylinder car capable of 80 m.p.h., the latest Chrysler "Imperial"—a larger and higher priced car—will make its debut at the National Automobile Shows. Prices will not be announced until this time.

The design of the chassis is conventional and does not depart from the general layout of the present six introduced exactly two years ago. Both these models as well as the four cylinder car will comprise the line.

While the salient feature of the new car is its high speed, it required extensive engine research to combine this factor with good low speed operation and hill climbing power without sacrificing any of these qualities. A new method of counterbalancing and a special type of piston have contributed largely to the unusually high output of the seven bearing $3\frac{1}{2}$ by 5 in. "L" head engine developing 92 brake hp. at 3000 r.p.m.

Rubber plays an important role in the makeup of the "Imperial" chassis. To secure quietest operation and to minimize chassis lubrication, the springs are carried in shock insulated rubber blocks instead of the conventional shackle bolt

method. No metallic contact is formed between the rear supports of the engine and the frame, the greater portion of the engine weight being taken in special rubber mountings, thus minimizing the transmission of engine noises to the frame and body. The usual method of employing rubber hose to complete the hydraulic four-wheel brake system is adopted and follows closely the layout on the smaller six.

Six Body Styles

Six body styles will be offered. A roadster, phaeton and sedan on a 120 in. wheelbase chassis and a four passenger coupe, seven passenger sedan and Berline on a 127 in. wheelbase. Standard tire size for all models is 32 by 6.20 in. mounted on artillery wheels, except for the roadster which has wire wheels as regular equipment. One piece full crowned fenders are a special feature of the new car.

None of the demonstration models being available the day MOTOR AGE visited the factory, the writer was given one of the new cars completed that same morning to drive. After a twenty minute spin to beyond the city limits the Chrysler "Imperial" was put through its paces. From a crawl, the accelerator pedal was pressed to the floor boards—

the car attaining better than 70 m.p.h. in a remarkably short distance without any signs of bucking or periods of vibration. On account of its general balance, quietness and positive steering, it was possible to maintain a comfortable touring speed of 50 m.p.h. without any feeling of unsteadiness. Railroad crossings were taken between 40 and 45 m.p.h., there being little jolting and no noise from the chassis. The steering was found to be very easy especially on short turns and the braking system all to be desired. In traffic the reserve of power made fast "get-aways" a simple matter and the use of second speed was practically unnecessary.

Much of the rakish appearance which the bodies present must be credited to the radiator and the hood design. As can be seen from the accompanying illustrations, the radiator shell has the general Chrysler appearance although the deep flutes tapering back along the cowl to just below the windshield give the car a totally different aspect. This design blends well with the moulding running from the radiator around the bodies giving a deep belt effect and harmonizing with the low roof lines. On the closed cars, narrow metal panels continued from the rear upper quarter

are employed where the edge of the top turns over to join the upper structure, thus giving smooth lines and a custom built appearance.

All closed bodies which are built by Fisher were developed in the Chrysler shops and follow conventional composite construction embodying steel panels. The interior appointments are unusually complete and have been laid out to provide maximum comfort. On the roadster model the rumble seat concealed in the rear deck may be opened for instant use by the releasing of a spring catch located behind the front seat. The backs of the latter are hinged for greatest comfort and move in unison with the seat cushions. To minimize neglect of the battery, a small Chrysler emblem located in the center of the instrument group flashes when the battery requires the addition of water. It is only necessary to remove a small detachable narrow panel in the floor board in front of the driver's seat to reach the battery filler caps. Bulbs of the two filament type controlled from a rotary switch in the center of the steering wheel, are placed in the center of the E. & J. headlights whose design matches the contour of the radiator. A small jewel in the upper part of the lamp shell indicates to the driver if the bulbs are alight in the dim position. With few exceptions, wherever trade names are referred to, the units have been modified or designed by Chrysler engineers exclusively for the new "Imperial" car.

As already stated, the engine is an "L" head unit of $3\frac{1}{2}$ by 5 in. bore and stroke with an N. A. C. C. h.p. rating of 29.40 and a piston displacement of 288 cu. in. Having a 4.8 compression ratio, 92 b.h.p. is delivered at 3000 r.p.m.

The unit power plant is supported in the frame at four points, the two feet cast on the timing chain cover being bolted to a heavy pressed steel cross member which also carries the radiator. At the rear the engine is mounted on rubber blocks held in place in a metal fitting attached to a steel cross member, the latter completely encircling the clutch housing. This cross member is assembled in place before the engine is set into the frame and is bolted at its ends to gusset plates on the frame. With this type of construction, the rear of the engine is relieved of any frame weaving and also simplifies the removal of the power plant when necessary.

Cylinder block and crankcase of cast iron are cast integral, with the detachable cylinder head of the high turbulence type. The bores are reamed and finished with two honing operations while the inside of the casting is treated with an impervious oil paint to seal all pores. The water passages which are of liberal dimensions may be inspected by the removal of two pressed steel headers on the left side of the engine.

Four-Point Suspension

Radical departure from standard crankshaft design has brought about unusually smooth operation of the seven bearing shaft by the employing of a series of twelve counterweights, two being attached directly opposite each of



Cutaway view showing the rubber shock insulating blocks for supporting the semi-elliptic springs.

the throws. These balances have been so compensated as to allow for the weights of the reciprocating parts. With this design the section of crankshaft for each cylinder is claimed to be in perfect balance for that unit. The shaft itself is of 1045 S. A. E. drop forging weighing 108 lb. and carried in bronze back babbitt lined bearings of the following dimensions. The diameter of shaft $2\frac{5}{8}$ in., length of journals 1 and $4\frac{1}{8}$ in., bearings 2, 3, 5, 6, $1\frac{3}{8}$ in., rear bearing $3\frac{1}{4}$ in. Oil holes are drilled diagonally from main bearing journal to crank pins. In addition to being static and dynamic balanced, a Lanchester vibration dampener is mounted on the forward end of the shaft and combined with the fan pulley. At the other end the balanced grey iron flywheel weighing 50 lb. and of $15\frac{5}{8}$ in. outside diameter has the steel starter ring gear shrunk on. Connecting rods of "I" section with a center to center length of $10\frac{7}{8}$ in. weigh 46 ozs. each when unassembled. The lower bearing which has the babbitt cast in the rod is of $2\frac{3}{8}$ in. diameter by $1\frac{1}{2}$ in. long. At the upper end the tubular pin of carburized and hardened steel is given a lapped finish and held in the rod by a locked bolt. The dimensions of the pin are 1 in. diameter by $3\frac{1}{8}$ in. long. All rods are carefully matched for balance prior to assembly.

Following two years of experiments with various metals and designs, a new type of piston is employed in the "Imperial" engine. The main feature of the piston is that it has all the advantages

of the aluminum type combined with the desirable qualities of those of cast iron. The piston itself is aluminum alloy with the piston pin bosses made of the same material and connected with the piston head through webbing. Horizontally the bosses are joined with the body of the piston by an Invar strut. Invar is a steel alloy having a negligible co-efficient of expansion but possessing an unusual degree of toughness.

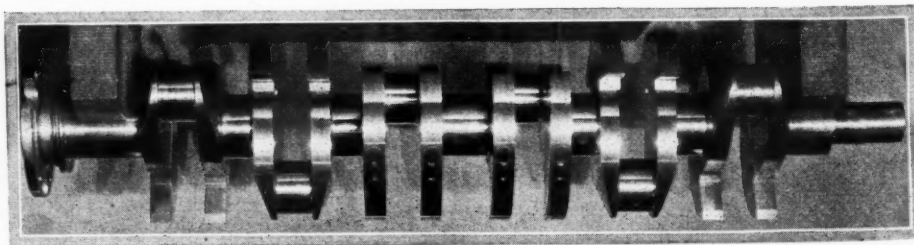
By employing the Invar strut between the piston pin bosses and the shell it is possible to fit the piston in the bores to limits as close as .003 in. to .0035 in. without danger of scoring or seizing. In manufacture, the Invar strut has several lips turned over on each side of its rectangular form. The piston is cast in a mould and the alloy is allowed to flow freely around the edges of the strut already in position so that it is completely secured and locked in place. Weighing 1.24 lb. the piston has a length from the center of the pin hole to the top of $2\frac{1}{8}$ in. while the overall length is 4 in. Three rings all above the pin are used, two being of the plain type with the lowest, an oil control design necessitating relief holes drilled in the groove.

Through a conventional triangular drive employing a $1\frac{1}{2}$ in. wide Morse chain of 78 links, the camshaft and accessories are operated. Adjustment for the chain is provided for by swinging the generator located on the right hand side of the engine. The camshaft of 1040 S. A. E. steel is carried in four bearings, the first or number one being of the bronze back babbitt lined type with the others formed in cast iron. Sizes of the bearings from front to rear are:

- No. 1 $2\frac{1}{4}$ by $1\frac{1}{2}$ in. length
- No. 2 $2\frac{1}{8}$ by $\frac{7}{8}$ in. length
- No. 3 $2\frac{3}{8}$ by $\frac{7}{8}$ in. length
- No. 4 $1\frac{1}{8}$ by $1\frac{1}{2}$ in. length

Cams of curved flank type operate the two piece mushroom tappets. The latter are held in two clusters of six each and provided with the conventional form of adjustment. While both valves are of the same dimensions they differ in type and material. The exhaust is of the tulip type made of silichrome with the inlet valve in chrome nickel and of the regular mushroom design. Valve port diameters are $1\frac{21}{32}$ in., the stems $\frac{3}{8}$ in. diameter, length $6\frac{1}{8}$ in., lift $\frac{1}{8}$ in. and the valve seat angle 45 degrees.

Through helical gears off the camshaft a vertical shaft is driven which operates the ignition distributor at its upper end and the oil pump at the lower extremity. The pump gears formed of a steel driving and a bronze driven gear are carried



The 7-bearing crankshaft employed on the new "Imperial" engine. The two counterweights opposite each throw should be noted.

in a cast iron housing. A large round brass mesh strains the oil in the pressed steel pans before entering the pump. The general arrangement of the pressure oiling system is the same as on the smaller six, oil passing to the main bearings through an oil manifold drilled in the case. A unique feature is the oil return line which feeds back directly into the aluminum housing encircling the strainer. To cleanse the oil of impurities, a Puro-lator filter is located on the dash and is placed in the direct pressure line of the oiling system.

Camshaft bearings are oiled through a hollow passage in the camshaft while holes drilled through the lower end of the connecting rods to the crankpin allow oil to be forced to the cylinder walls and piston pin when the hole in the crankpin coincides with the orifice in the connecting rod. A separate lead carries oil to the timing chain. Other parts are lubricated by mist. A bayonet type of gage is employed to show the oil level which at the "full" mark indicates a seven quart capacity.

Distributor on Left Side

The distributor located in the center on the left side of the cylinder head is in a very accessible position. It is of the semi-automatic, double breaker type with a counter clockwise direction of rotation. The high tension wires pass through insulated ducts to the $\frac{7}{8}$ in. 18 std. A.C. spark plugs. All four electrical units are of Remy make with the battery a 6-8 volt, 160 amp. hrs. Prestolite. Model designation of the various units are:

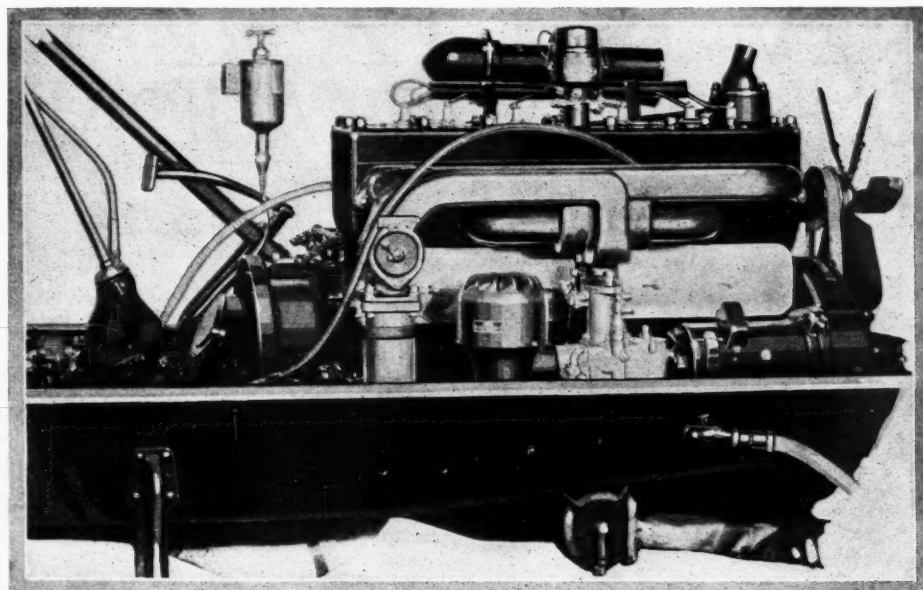
Distributor—732-A
Coil—525-B
Generator—945-B
Starter—732-A

Mounted on the left side of the flywheel housing, the starter can be quickly removed by the loosening of a single nut and stud. Engagement with the 124 tooth ring gear is through a 11 tooth pinion mounted on a sliding gear with an over-running clutch. The generator is of the third brush type with thermostat control.

Both intake and exhaust manifolds are cast integral and follow the same design as on the smaller six only they are proportionately smaller.

The carburetor, a specially developed Stromberg OX-3, is bolted directly through a top outlet to the intake manifold. Two of the more important developments are the providing of a knurled screw in which are marked eight settings enabling the driver to adjust his carburetor to suit the best driving conditions. The other device is a needle valve which automatically increases the fuel supply when the choke is raised. In addition a fumer or electrical heating device is installed in the bowl of the carburetor to facilitate starting in cold weather.

Water is circulated through the cooling system by a centrifugal pump attached by three bolts to the front of the cylinder block. On the other end of the shaft carrying the impellor is placed a six bladed fan of 16 in. diameter, the latter being carried on double row ball bearings in the same housing as supports



Right side of the power plant. The by-pass for heating the intake manifold when the engine is cold may be seen. The distributor on the top of the block and the air cleaner should be noted.

the water pump. The entire unit is driven by a "vee" belt off the crankshaft, adjustment being compensated for by a movable flange on the fan pulley.

In many respects the clutch which is of the single, dry plate type follows closely the design employed in the Chrysler four. On both sides of the pressed steel clutch plate is basket weave friction material woven integral with the plate. Knurled nut adjustments are provided with spring locks to govern the pressure applied to the plate through the several coil springs. The radial ball throwout bearing is lubricated by a pressure gun attachment. At the forward end the pilot shaft is carried in a ball bearing in the end of the crankshaft while at

the rear the main $1\frac{1}{2}$ in. shaft is supported in a large roller bearing. There is a large inspection cover on the housing.

Bolted directly to the bell housing, the gearset is of conventional design and provides the following ratios:

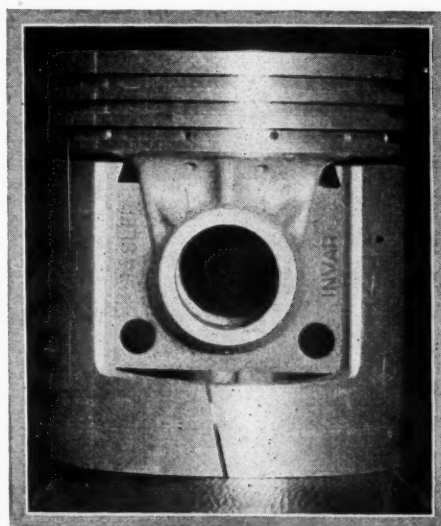
Low, 3.20 to 1
2nd, 1.81 to 1
3rd, 1.00 to 1
Rev., 4.06 to 1

The main shaft is supported at the forward end in a roller bearing and at the rear in a plain ball bearing immediately behind of which is the drive for the speedometer. The counter shaft is stationary with the gear cluster carried on rolled bearings.

All gears are given a burnished finish. The emergency brake operates on a drum behind the gearset and in the lever mechanism is incorporated a compensating spring to prevent over travel of the ratchet and make the lower hard to operate. To give the front compartment a clean appearance, the brake lever protrudes through a conical and self contained opening similar to the gear shift lever. In addition, the ratchet release rod passes through the center of the lever and operated through a button. The dimensions of the emergency drum are 8 in. diameter by $2\frac{1}{8}$ in. wide giving a braking area of 49 sq. in. Thickness of the lining is $\frac{5}{32}$ in. The gearset is specially made for the car by the Detroit gear Co.

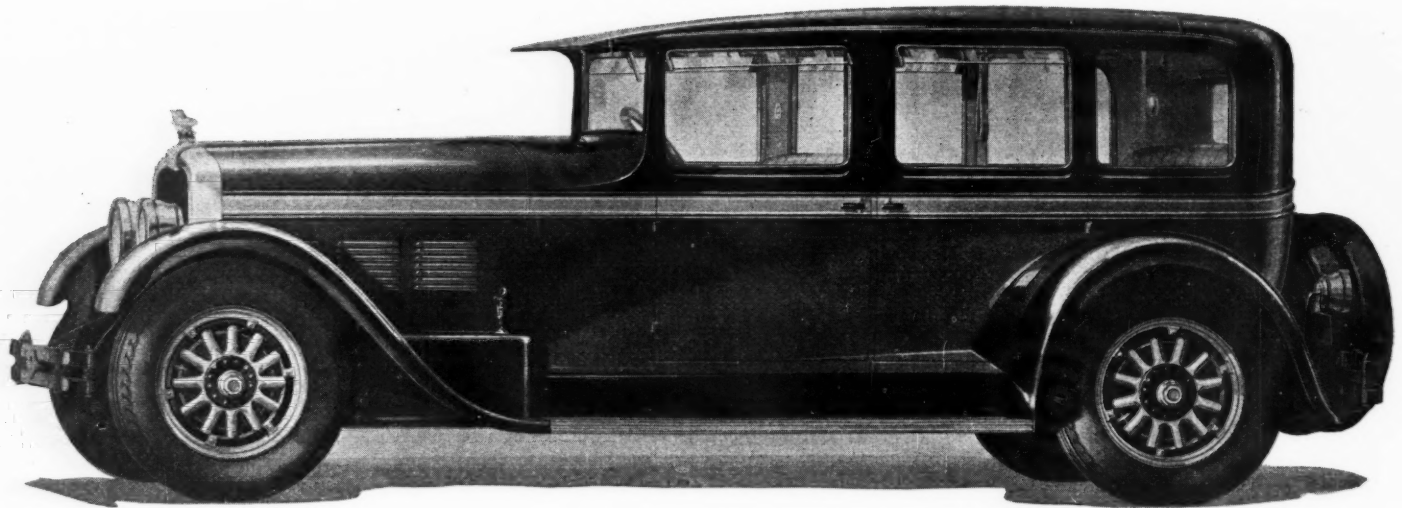
At either end of the $2\frac{3}{4}$ in. diameter tubular propellor shaft is mounted a trunnion type universal joint. Final drive is through the Hotchkiss system. The rear axle specially made by the Timken company is of the semi-floating type and provided with two standard ratios for domestic use 4.27 and 4.63 to 1 and a 4.09 to 1 ratio for the export market. The drive pinion integral with the short shaft

(Continued on page 23)



The new piston employed in the "Imperial" engine. The rectangular piece is made of Invar, a non-expansive steel alloy. This type of construction enables the aluminum alloy piston to be fitted to limits as close as .003 in. without damage to the bores.

NEW STUTZ REplete WITH UNIQUE MECHANICAL FEATURES



New Stutz five-passenger sedan, with double belt and distinctive hood and radiator lines.

By W. L. CARVER

THE coordination of a chassis and a power plant which are replete in unique mechanical developments with a line of bodies low and rakish, but still dignified and comfortable, makes the New Stutz Vertical Eight a most unusual car. No single feature stands out beyond any of the others, but all have been combined to produce well rounded, striking appearance, all-around performance and simplicity of maintenance.

That the make-up of the new Safety chassis is unusual is demonstrated best by a brief resume of some of its features.

The engine is eight-in-line with nine main bearings and an overhead camshaft which is driven by silent chain at the front end. Maximum h.p. is 92.

Rear end drive is through a Timken F. J. worm gear assembly with the worm undermounted.

Brakes which are fitted to all four wheels are the new Timken hydraulic type which require low operating pressure and have almost 360 deg. contact in semi-steel brake drums which are equipped with cooling fins.

Frame height amidship is just over 18 in., producing a floor board height above the ground of a fraction more than 20 in.

All chassis bearings are lubricated periodically from the engine by the Meyers reservoir system.

Although the wheelbase is 131 in., the car turns in a 24 ft. radius. Steering is by a Ross cam and lever gear.

Springs are unusually long and flexible and have been designed to coordinate with balloon tires. Front springs are shackled at the front and anchored at the rear.

Frame is 7 3/4 in. deep and reinforced by heavy tubular cross members and

rolled steel flange running boards which bolt directly to outer faces of side members.

Bodies in themselves represent no radical departure from the conventional, but when coordinated with the chassis produce a striking combination. The maximum overall height of the entire line of bodies is 70 in. and a man of ordinary height standing on the curb can see clear over the top. Although the overall height is strikingly low, head room has not been skimped and is as liberal as that of the most conservative body. The seat level when on the road is approximately 30 in. above the pavement, leaving about 39 in. headroom. Liberal leg room is found in both front and rear compartments of all bodies.

Windows and doors are wide and particular attention has been paid to the vision of the driver as well as the passengers. All windows at the sides are fitted with plate glass eaves which pro-

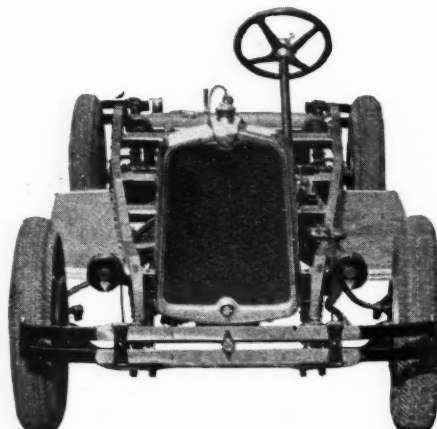
vide ventilation without draft and interference with vision.

That the characteristics which have been high-spotted in the foregoing paragraphs are reflected in the performance of the car has been demonstrated by a representative of this publication. Several laps were driven around the Indianapolis track at an average time of two min., which is equivalent to 75 m.p.h. Acceleration from 5 to 25 m.p.h. required 6.5 seconds and from 10 to 40 m.p.h., 10.6 sec. From 20 to 60 m.p.h. required 17 sec. At 60 m.p.h. the car shows a terrific punch and can be taken to 75 m.p.h. like a racing job.

However, this performance was overshadowed by the characteristics of the car on the road. In a half-day's drive in rain over brick pavement, asphalt and gravel, the car was driven at speeds as high as 65 m.p.h. with no feeling of danger. The brakes were applied at speed on the straightaway and in turns with no skid. Short turns in gravel were entered at speeds of better than 50 and the brakes were thrown on hard before the steering wheel was thrown over with no perceptible skid or roll. A winding clay test hill, with maximum grade of 20 per cent, which was extremely muddy, was approached at 10 m.p.h. and negotiated in record time with no feeling of lugging. The combination of smooth liberal engine power, low center of gravity, balance, and sweet brakes is responsible for this performance.

Six Body Types at \$2,995

Six body types, all priced at \$2,995, are supplied on the new chassis. All models are equipped with shockproof windshields in which wires running transversely about 2 1/2 in. apart are



Front view of chassis of new Stutz.

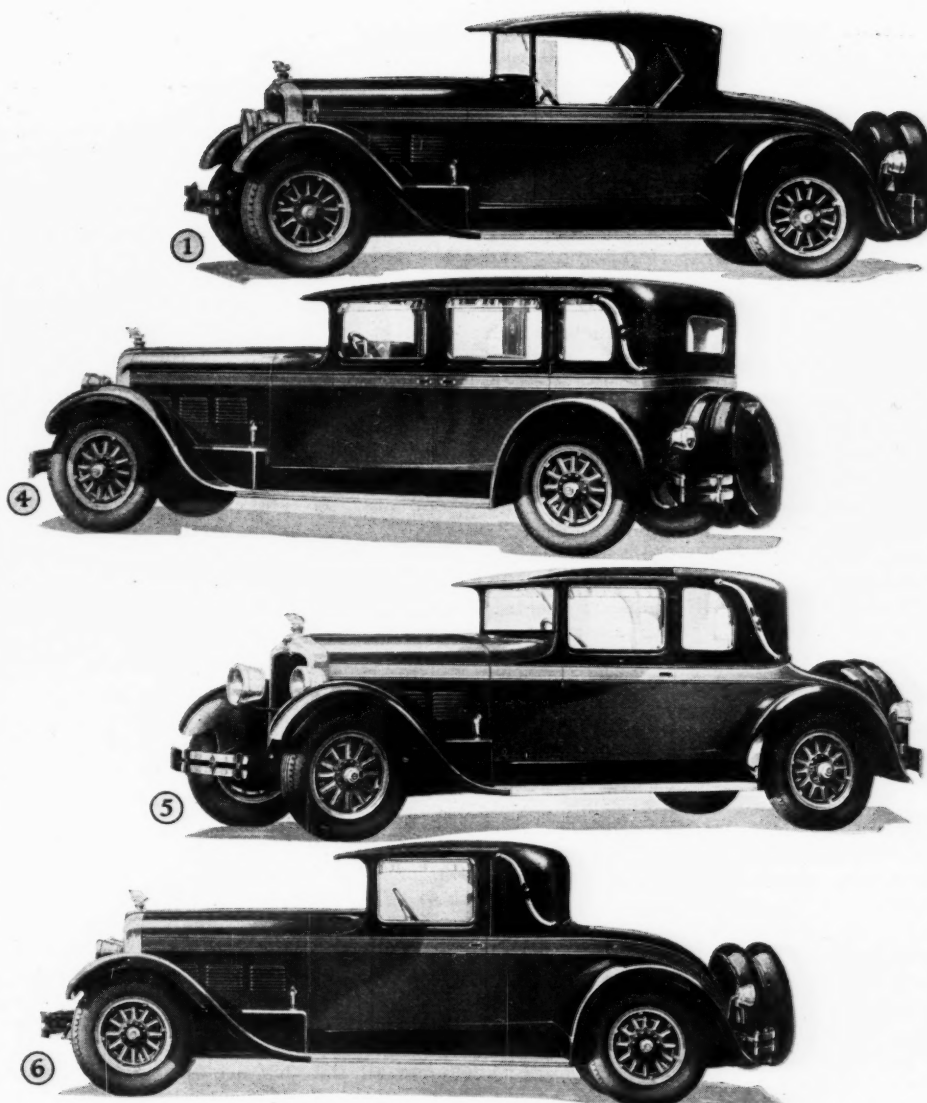
Some Details of New Stutz

Price.....	\$2,995
Wheelbase	131 in.
Cyl. bore and stroke	3 3/16x4 1/2 in.
No. cylinders ..	8
Piston displacement	287.27 cu. in.
N. A. C. C. h.p. rating	32.52
Compression ratio	4.8 to 1
No. main bearings	9
Tires	32x6.20 in.
Springs (rear)	62x2 1/4 in.
Springs (front)	38x2 1/4 in.
Rear axle drive	Worm gear

placed in the glass as it is made. With this construction it is practically impossible to dislodge jagged fragments of any appreciable size, nor can stones or other materials ordinarily encountered on the road pass through the windshield. All bodies are fitted with dual rear vision mirrors and Folberth windshield cleaners. Electric cigar lighters on extension cords are carried on the instrument boards. An auxiliary trouble lamp is clipped back of the instrument board and can be fitted to the cigar lighter socket. A push button switch locks the retracting spring of the lighter cord at will.

Instruments are grouped on an elliptical panel on the dash and are protected by a single glass with interior illumination for night driving. The top of the panel is decorated to correspond with the characteristic radiator. Instruments comprise a Stewart speedometer, a Phinney Walker clock, a Grolan gasoline gage and an engine thermometer, ammeter and oil gage, all made by the National Gauge and Equipment Co. The carburetor choke control and push button ignition switch are installed symmetrically with the instrument panel. Upholstery in the open cars is hand buffed leather dyed to harmonize with the body finishing scheme. Closed cars which are fitted with smoking and vanity sets are upholstered in Laidlaw No. 1390 cloth with Chase mohair optional at increased price. Here again the interior color scheme harmonizes with the exterior finish.

Steering wheels in all models are 18 in. dia., and both rim and spider are made of solid walnut. In addition to the usual short levers for ignition and carburetor control and the horn button, another longer lever at the head of the steering column controls the lighting circuit, being connected through the interior of the column to a switch box which is located on the steering gear housing. Several positions on this switch provide proper lighting for all conditions. Nickel plated Brown headlamps provide long and short driving beams and



Four of the six new Stutz body styles. Fig. 1 is the two-passenger speedster; Fig. 4 the four-passenger victoria; Fig. 5 the four-passenger victoria with offset driver's seat and auxiliary folding seat; Fig. 6 the two-passenger coupe with rumble seat and adjustable rear window. Road clearance is 8 in. on all models.

parking lights. At the rear a combination tail, stop and reverse lamp harmonizes with the headlamps. Gear and hand-brake levers are long and convenient to the wheel and a hinged strap type of accelerator pedal is used.

Nickel plated shells are fitted to the Fedders radiators and the cap, which also is nickel plated, carries a distinctive emblem. Double bar nickel bumpers are used at the front and bumperettes at the rear. These do not require the usual mounting brackets, as provisions for their direct mounting have been made at the spring horns. At the rear a pressed steel tire carrier with screw and lock adjustment for the reception of the tire is carried by substantial brackets.

General appearance is rounded out by artillery type wheels finished in natural wood. Visors are integral with both open and closed tops, being extensions in either case. Roof lines are curved slightly over the top to harmonize with the low, flowing lines. All bodies are finished with a double belt as shown. The beads are lacquered black with a red

hair-line stripe. Pyroxylin enamel finish is used over the entire body, while black bituminous enamel is used on fenders, splash guards and running gear. Superstructures of all closed bodies are finished in black pyroxylin enamel.

Description of Bodies

Bodies with their color schemes and special equipment are listed as follows:

Two-Passenger Speedster. Fitted with rumble seat for two passengers and golf bag compartment. Top including integral visor with natural wood bows and nickel fittings folds back and top boot is regular equipment. The rear curtain can be taken out entirely and top can be detached easily. Windshield frame is nickel plated and carries windshield wings. In addition to the rear view mirror on the windshield, a circular mirror is mounted on the left fender. Sea fog grey and ocean blue form one two-tone combination, another is light chicle drab and copra drab, while the third is light sage green and dark sage green.

Four-passenger speedster. General specifications are the same as those for

the preceding car and the same color schemes are used. Of course no rumble seat and golf bag compartment go with the two seater job. An added bit of standard equipment is a rear compartment cover or storm apron which attaches by means of snap fasteners.

Five-passenger sedan, and Brougham. The general make-up of these two bodies is much alike, the exception being the leather rear quarter top irons and D-shaped windows in the brougham which replace the standard rear quarter window in the sedan. Equipment which is otherwise standard includes smoking and vanity sets and cord robe hanger. Two-tone color combinations are Bambalina blue and Algerian blue in one case and the combination of Plymouth and Buckingham gray for the other.

Victoria coupe. A four-passenger body with the conventional individual driver's seat and auxiliary seat which folds under the instrument board. There is room in the rear deck for golf clubs on the left side. Top has leather rear quarters, ornamental top irons and D-shaped rear windows.

Two-passenger coupe. Has a single cross seat which is wide enough to accommodate three people comfortably. Rear quarters are leather fitted with top irons and no window. A rumble seat finished in black leather accommodates two extra passengers and the rear window lowers to afford communication with the interior of the body.

Following are the color schemes in which the two last named body models can be obtained:

Kensington grey, light and Wellington grey, dark.

Palmetto green, light and Tarragon green, dark.

Chicle drab, light and Copra drab, dark.

Green, light and green, dark.

Cobalt blue, light and dark blue.

Sage green, light and sage green, dark.

Wire wheels are optional equipment on all models at an additional cost. All windshields are one piece and can be swung forward for additional ventilation although cowl ventilators are standard equipment.

Worm Gear Is Undermounted

Before entering the detailed description of the mechanical units it will be well to refer to Fig. 7 which illustrates the manner in which all of the units have been coordinated to produce the striking low appearance with more than liberal head room. Three major factors are responsible for this combination. The first is the worm drive axle which with the undermounted worm drops the rear end of the propeller shaft $5\frac{1}{4}$ in. below its location with the ordinary bevel drive axle. Furthermore the distance from the center of the axle shafts to the top of the worm gear housing is $4\frac{1}{8}$ in., which is about 2 in. less than that of a bevel drive axle of the same capacity. This difference plus the characteristic shape of the two axle housings allows the rear seat to be lowered at

least three in. below the ordinary relationship.

With the lower propeller shaft, a straight line drive in the loaded position drops all of the elements of the transmission line below the usual relationship to the wheel centers. This fact with a special gear box cover which reduces the height of that assembly by $1\frac{1}{4}$ in. has permitted the frame and floor board lines to be dropped well below the minimum height established by the usual arrangement. It will be noted that the bell housing is accommodated by the space below the inclined toe boards in the front compartment.

In order to take full advantage of these possibilities the frame is built with a double drop. The amidship section from the dash to a point just ahead of the rear seat pedestal is 18 in. above the ground in the loaded position. The frame has a long inclined drop of between $4\frac{1}{2}$ and 5 in. in the section between the front axle and the dash while the kick-up at the rear axle is more than 7 in.

92 Horsepower Maximum

As illustrated by Fig. 8, 92 h.p. is the maximum developed by the engine at 3,200 r.p.m. Cylinder bore is $3\frac{1}{8}$ in. and the stroke is $4\frac{1}{2}$ in. Maximum torque is approximately 193 lbs. ft. at 1,400 r.p.m. With eight cylinders of these dimensions, the displacement is 287.27 cu. in. and the N. A. C. C. rating is 32.52 h.p. The compression ratio is 4.8 to 1.

Monobloc construction is used for the cylinders and these with the upper half of the crankcase are a single iron casting. Added rigidity is secured by parting the crankcase well below the centerline of the crankshaft with a liberal flange all the way around the joint. In addition to these provisions, the seven intermediate main bearings are carried in T-flanged bulkheads which contribute materially to the lateral and vertical rigidity of the unit. The bell housing is cast integrally with the cylinder block.

Main bearings of the crankshaft are $2\frac{1}{2}$ in. dia. from end to end, and are carried in shimless interchangeable bronze back babbitt bushings of the full contact type.

Effective length of main bearings is as follows:

Front	$3\frac{1}{8}$ in.
Center	$1\frac{1}{8}$ in. including fillets
Rear	$2\frac{5}{8}$ in. including fillets
Intermediate	$1\frac{1}{8}$ in. including fillets

The dia. of the connecting rod bearing is $2\frac{3}{8}$ in. while the length is $1\frac{1}{8}$ in. Oval cheeks are used at each crank throw and the entire shaft is machined all over. The crank arrangement is 2-4-2 so that the two throws at each end constitute one four cylinder crank and the middle four form another four cylinder crank. This arrangement eliminates any unbalanced couple. Due to its form the shaft is in inherent dynamic and static balance. Crankshaft material is S. A. E. 1045 steel.

Main bearing caps are cast iron. The front and rear are retained by four $\frac{1}{8}$ in. dia. studs while two $\frac{1}{2}$ in. studs are

used at the center cap and two $\frac{1}{8}$ in. dia. studs are used at the six intermediate caps. All of these studs are $3\frac{1}{2}$ nickel steel alloy. The rear cap construction includes the oil seal for the crankcase compartment with a slinger well and drain.

Connecting rods are duralumin alloy and are $9\frac{1}{4}$ in. long between centers. S. A. E. No. 10 white metal is cast centrifugally into the lower end on a tin bond. Bearing caps are retained by two $\frac{1}{8}$ in. dia. chrome nickel steel bolts. The complete rod assembly weighs just over 30 oz. and the shank is H-section. In the upper end of the rod a bushing of S. A. E. No. 62 bronze is press fitted. The effective dia. and length are $\frac{7}{8}$ and $1\frac{1}{8}$ in. respectively.

No screw retainer is used at the piston pin which floats in both rod and piston. Bearing in the bronze bushing at the head of the rod and the two cast iron surfaces in the piston is distributed equally and Tobin bronze plugs are inserted in the pin ends to permit floating without scoring the cylinders. Pins are made of S. A. E. 1020 steel, case-hardened, ground and lapped. The piston bearings are reamed and the bronze bushing in the rod is fly-cut.

Pistons are cast iron of a high steel mixture and are somewhat unusual, as the pin bearing is located midway in the bearing portion of the skirt, the three-ring band being only an auxiliary portion which serves the purpose of sealing the cylinder. Piston walls are full cylindrical and $\frac{3}{64}$ in. thick with an eccentric ground clearance at the pin ends. Perfect circle rings of $\frac{1}{8}$ in. width are fitted in all three grooves and the excess oil which collects at the lower ring is delivered to the pin bearing by two parallel shallow grooves milled vertically at each end of the eccentric clearance area at the pin ends. Pistons

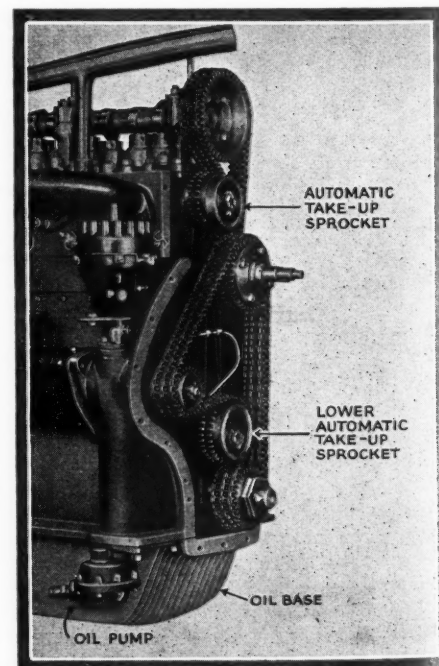


Fig. 10. Arrangement of chain drive for overhead camshaft in new Stutz engine.

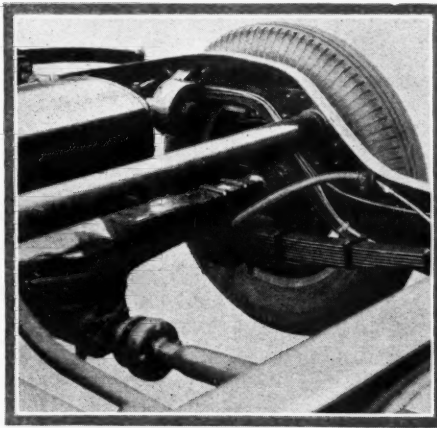
are ground flat over the top. The weight of a complete piston and rod assembly is 59 oz.

Cooling Fins on Crankcase Pan

The interior of the engine viewed with the crankcase pan removed, as illustrated by Fig. 9, is remarkably clean, as only the crankshaft and reciprocating assemblies are contained in this portion of the engine. Cast aluminum is used for the crankcase pan which is 5 in. deep, with 14 longitudinal cooling fins cast on the bottom exterior. Splash bars are cast in, and the sump is formed by bolted-in sheet metal plates. A tubular screen of .014 bronze wire, 20 mesh, protects the pump intake. The balance of the lubricating system will be described later. As the sump is 5 in. deep and is bolted to the lower crankcase flange which is located $2\frac{1}{4}$ in. below the crank center, the total depth of the crankcase is $7\frac{1}{4}$ in.

One of the most novel features of the new engine is the silent chain drive to the overhead camshaft. Two Link-Belt silent chains are used, both of $\frac{3}{8}$ in. pitch. The lower chain, which also drives the accessories shaft, is $1\frac{1}{2}$ in. wide, while the upper chain is $1\frac{3}{8}$ in. wide. Thirty teeth are cut in the sprocket which is attached at the front end of the crankshaft. From this sprocket, the chain passes over a Link-Belt patent adjustable idler having 25 teeth and then around a 25 tooth sprocket on the front end of the accessory shaft which is located at the right side of the engine. Finally the chain passes over the 36 tooth front sprocket of the transfer shaft and thence back to the crankshaft sprocket.

In the upper train, the drive starts at the 27 tooth rear sprocket of the transfer assembly and the chain passes over another automatic tightener having 27 teeth and then around a 45 tooth sprocket on the front of the camshaft and then back to the transfer sprocket. With this arrangement all shafts when viewed from the front run in a clockwise direction and the drive to the camshaft is transmitted through the two vertical sections of the chains with the idlers located on what would otherwise be the slack side. All sprockets are hardened



Stutz rear axle showing worm gear housing and mounting of springs below axle.

as are the various components of the chain assemblies. Each of these chains is stretched and then bench tested for alignment and silence before leaving the Indianapolis plant of the Link-Belt Co. Links instead of being simply the product of a stamping operation are first blanked and then shaved to true contour. All of the sprockets are produced in the same plant.

How Idlers Take Up Slack

Spiral springs take up the slack at the idler sprockets and a locking device adjusts the position of the eccentrically mounted idlers to each stage of chain wear, thus preventing any possibility of chain slap. Idlers as well as the transfer assembly are carried on heavy studs which are fixed in either the crankcase or cylinder head. The transfer assembly is lubricated by high pressure from the main oil line and the bearing combination is phosphor bronze on hardened steel. A flange shaft which bolts on the front of the transfer assembly drives the six bladed $16\frac{1}{2}$ in. dia. fan through a friction clutch.

Analysis of the front end drive reveals that only the crankshaft and camshaft run at speeds which are integral multiples or possibly harmonic. The accessory shaft is driven at $\frac{5}{6}$ crankshaft speed while the transfer assembly rotates at $\frac{11}{5}$ crankshaft speed. This arrangement eliminates any chance of

harmonic periods of vibration. It is stated that the combination of a heavy, well supported crankshaft, silent chain drive with the cushioning or absorbing effect of the idlers and the varying speeds of the front end, has nullified the question of torsional vibration. No period was found upon careful check on the track at any speed from 5 to 75 m.p.h.

Four bolts secure the camshaft sprocket to a flange at the front of the camshaft. These bolts are spaced at equal angles and therefore in combination with the 45 teeth allow very close adjustment of the angular relationship of the cam to the crankshaft. In fact this sprocket is removed when the valves are to be ground and re-assembly is not governed by marks on the sprockets but by setting the camshaft for dead center position of the crankshaft. Auxiliary covers at the front of the cylinder head and cover facilitate this work and keep the time of the service operation down.

Five phosphor bronze pedestals provide the supports and bearings for the camshaft. The dia. at the front bearing is $2\frac{3}{8}$ in. and length $1\frac{1}{8}$ in. while the dia. and length at the other four are $1\frac{1}{2}$ in. and $1\frac{1}{4}$ in. respectively. Bearings are situated between each group of two cylinders. The barrel dia. of the camshaft is $1\frac{1}{2}$ in. and the shaft is rifle drilled from end to end and then the ends are plugged. S. A. E. 1015 steel of a special forging quality is carburized and hardened at the bearing and cam surfaces. Radial oil holes are drilled at each camshaft bearing, the oil intake being at the front pedestal and the outlet to the rectifier at the rear pedestal.

Cams Automatically Lubricated

As illustrated by fig. 11 each cam is fitted with a special lubricating device which eliminates the possibility of stoppage when small metering holes are used. At the heel of each cam a hole is tapped into the interior drilled oil passage. Into this tapped hole, a small special bronze fitting is threaded and staked. This bronze fitting carries a bronze pin which is .004 in. smaller in dia. than the hole in which it operates. Due to the combination of centrifugal force and the oil pressure within the shaft, this pin is held in the outer posi-

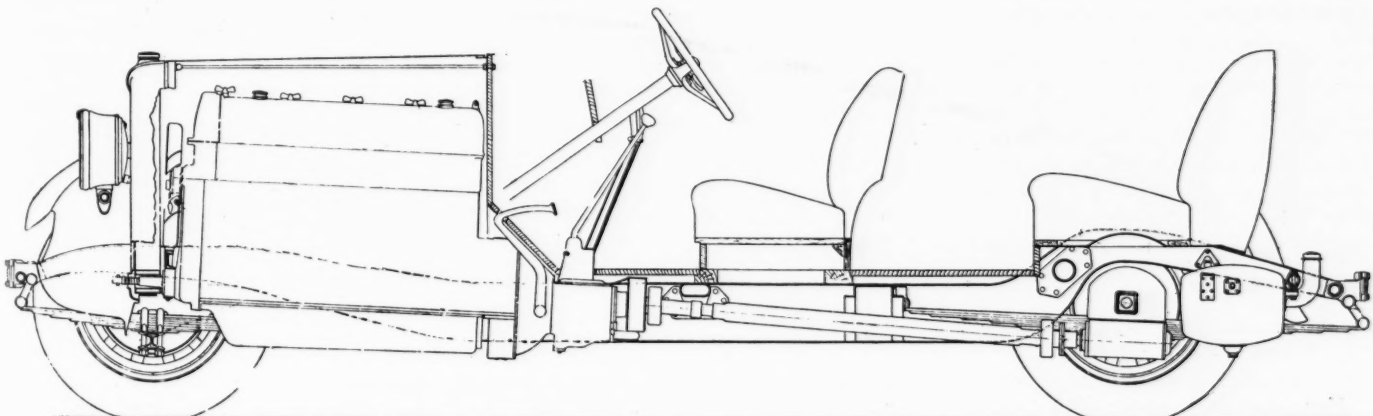


Fig. 7. Side elevation line drawing of new Stutz chassis illustrating advantages of coordinating worm drive axle, straight line drive and double drop frame.

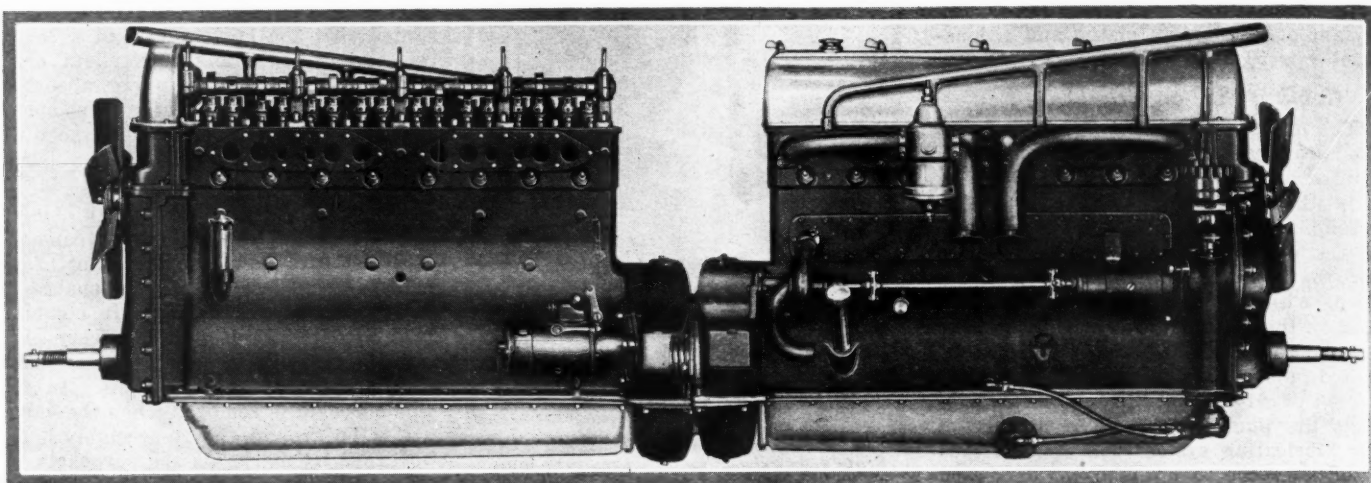


Fig. 12 (left). Left side of Stutz engine showing general overhead arrangement and porting.
Fig. 13 (right). Right side of engine with valve housing cover in place.

tion except when it is forced inwardly as the heel of the cam passes over the valve lifter nut. The reciprocating action which is set up is self cleaning and the desired amount of oil is carried out in the joint between the pin and the fitting. A small cross pin in the inner end retains the metering pin when in the outward position.

Due to the metered supply of lubricant which is supplied to the wiping surface of the valve operating nut no perceptible noise is set up at this point, although the clearances are unusually large. The clearance at the intake valves is .032 in. while the exhaust clearance is .028 in. Little or no noise is produced at fairly high speeds even when the cylinder head cover is removed. Intake and exhaust cams have the same contour and are ground from the same master cam, the lift being $\frac{1}{2}$ in., and the valve timing is approximately conventional.

Ignition Is Dual

Cast iron is used for the cylinder head which is unusually deep. The cylindrical combustion space which is somewhat larger than the cylinder bore is machined in the lower face of the head and 16 valves are set in a row on the longitudinal centerline of the engine. Valves are ported individually with eight intake openings on the left side and eight exhaust openings on the right side. Four small auxiliary exhaust ports which connect with those of cylinders 2, 3, 6 and 7 come out at the left side of the head to provide heat for the intake manifold. As ignition is dual, metric spark plug holes are tapped at an angle near the base.

As illustrated by fig. 11, the clear dia. of the valve ports is $1\frac{1}{8}$ in. and the angle of the valve seat is 45 deg. Valve heads have a modified tulip shape and the stem dia. is $\frac{3}{8}$ in., the material being chrome silicon alloy. Valve stems are centered in pressed-in cast iron guides, and the upper end, which is threaded to S. A. E. $\frac{3}{8}$ in. 24 pitch to receive the valve operating nut and piston, is guided by the latter unit in a cast

iron sleeve that is piloted and bolted to the upper face of the head.

As illustrated, the valve stem nut is relieved on the outer dia. while the piston is ground to $1\frac{1}{2}$ in. dia. and has a length of $\frac{7}{8}$ in., which provides adequate bearing surface to withstand the side thrust of the cams. Eight cross holes are drilled in the barrels of both parts to provide means for valve clearance adjustment. Also one side of the guide is cut out to provide access to the holes in the valve piston. With this arrangement, two short rods of about $\frac{1}{8}$ in. dia. constitute the tool equipment for valve adjustment. The oil which is distributed by the camshaft over the top of the nut supplies lubrication. Much of this is skimmed off by the bevel end at the top of the upper guide and the remainder passes down the bearing surfaces at the large dia., which keeps it off the valve stems. The seat for the valve stem guide is a milled trough running almost the full length of the head. Drains back to the crankcase are provided at each end so that only fog reaches the valve stems. Valve springs are of liberal length and exert a pressure of 40 lbs. when the valve is closed and 90 lbs. in the open position.

The general appearance of the overhead layout is illustrated by fig. 12, and the aluminum valve housing cover is shown in place in fig. 13. Two vents are placed in the top of the cover which is secured by five wing nuts and studs. The auxiliary covers at the front end also are shown by fig. 13.

Dual Manifolding System

Fig. 12 also shows the porting on the intake side of the engine with the four auxiliary exhaust passages. A Swan dual manifold and a $1\frac{1}{4}$ in. Zenith duplex-SV5D carbureter are used here. In this arrangement the center group of four cylinders which are equivalent to one four cylinder engine are supplied by the inner half of the carbureter and the inner portion of the swan manifold. Similarly, the pairs of two cylinders at each end of the block which are equivalent to another four cylinder engine are

supplied by the outer half of the carbureter and a separate manifold arrangement. No connection between the two manifolds occurs at any point. In the carbureter a single float chamber is used but beyond that point the effect is that of two individual carbureters except that both butterfly valves are on a single stem.

Heat is applied at a throat just below the branch sections of the manifold. At low speeds the exhaust surges back and forth through the heating chamber around the throat while the great volume of exhaust gas at high speeds and the rapidity of sequence of exhaust valve opening tend to create a dead end at the heating chamber. Therefore more heat is delivered at low than at high throttle openings.

Oil Pump Is Accessible

Fig. 13 illustrates the installation of the balance of the auxiliaries at the right side of the engine. As shown, the exhaust manifolds for the front and rear sets of four cylinders are separate and have individual exhaust pipes extending down to the junction with the horizontal pipe which connects with the A. C. muffler. The junction of the three pipes is in a cast fitting having a detachable lower cover for the purposes of engine tuning. This arrangement eliminates the exhaust surging which occurs when a single exhaust manifold is used on an eight-in-a-row engine. The rear exhaust manifold carries a Wall rectifier which distills the impurities out of the crankcase lubricant. This rectifier, the invention of Col. Guy Wall, draws its supply from the low pressure line at the rear end of the camshaft and discharges the rectified oil to the sump. Volatile vapors and steam are returned to the intake manifold, while carbon and dirt are separated out of the hot oil by a much finer filter than can be used with cold oil.

A vertical tubular extension in the wall of the crankcase which is just back of the timing gear cover flange provides the location for the oil pump and distributor head. It will be noted that every auxiliary unit on the entire engine

has an external, easily accessible location and that any one unit can be removed by withdrawing two or three nuts or bolts without disturbing any other.

Two contact arms and a four-lobed cam are used in a Delco No. 5296 distributor which is controlled by both manual and automatic advance. Eight high tension wires are carried in a two-piece pressed steel manifold of gradually decreasing section at each side of the block. The coil is Delco No. 2191. No fuses are used at any place in the electric system, as a circuit breaker is installed on the dash. Three-bolted flange mounting is used for the Delco No. 333 generator.

Relatively wide gears are used in the oil pump to assure liberal oil supply at all speeds. Oil is drawn from the tubular screen inside the engine pan by an external copper tube line and is delivered by a similar line to a connection located in plane with center bearing just above the lower crankcase flange. From this point the oil passes through an inclined drill hole upward to another large hole which is drilled the full length of the block. Drilled holes connect this passage with each of the main bearings and drilled holes from all but the front and rear bearings connect with the connecting rod throws, two holes communicating with the center main bearing. Cylinder wall lubrication is by splash from the crank throws.

Stainless Steel Water Pump

Supply to the camshaft is delivered by a hole drilled vertically through the cylinder block and head and indexing with a hole in the front camshaft bearing pedestal. Small drilled outlets from this vertical passage supply oil to the idler, intermediate and accessory shafts. Camshaft lubrication already has been described. The surplus oil which leaves the rear end of this shaft passes down through the rear bearing pedestal and out to the chassis lubricating by-pass and the rectifier. The oil pressure regulator is shown just below the water pump propeller shaft in Fig. 13 and the oil filler and bayonet gage are close by.

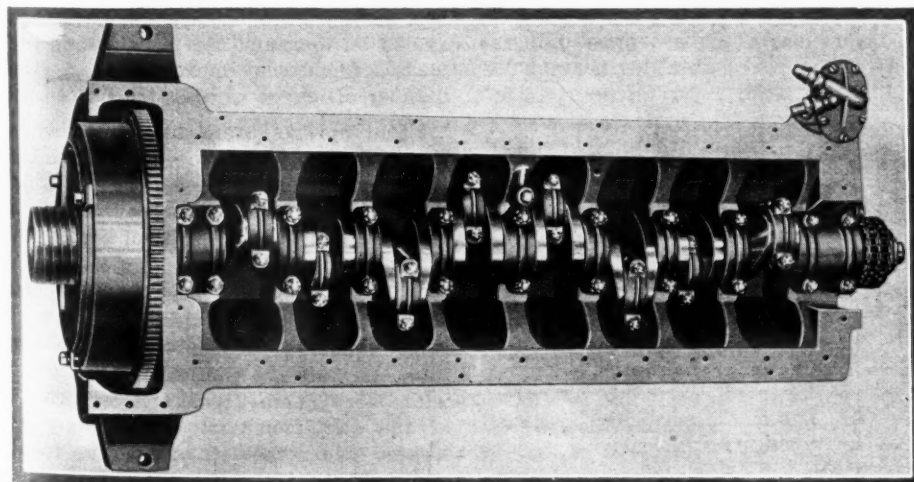


Fig. 9. Interior of crankcase which contains only crankshaft and reciprocating assemblies. Also shows clutch and oil pump.

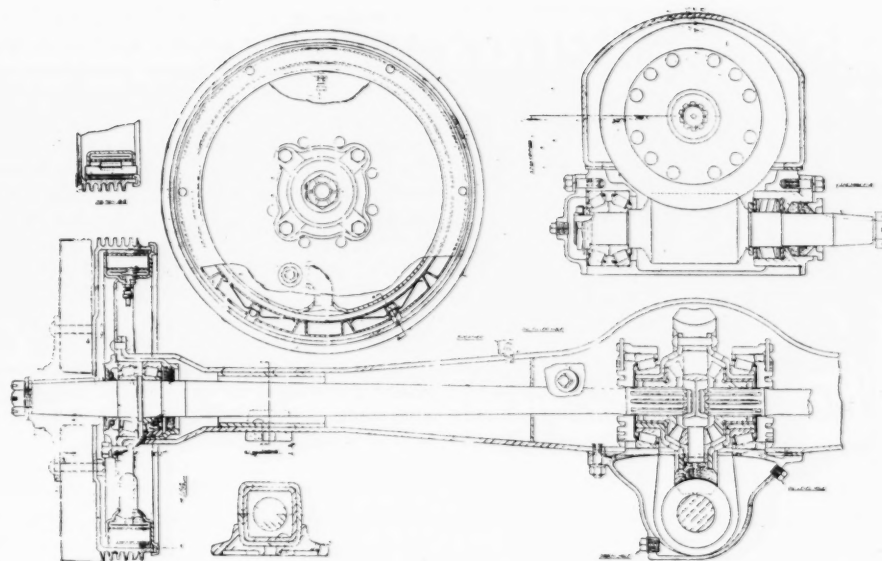


Fig. 14. Cross section of Stutz worm driven axle and new hydraulic brakes.

From the rear of the generator shaft a balanced propeller shaft and universal joints drive the water pump shaft which is stainless steel with a single knurled packing gland for manual take-up, no wrench or other tools being required. The pump is carried on the bell housing symmetrically with the starting motor. A long steel tube and two hose connections connect the pump intake with the bottom tank of the Fedders radiator while a short hose connection leads to the rear of two cover plates which are bolted to the side of the water jacket.

A flange at the rear end of the crankshaft carries a semi-steel flywheel of 12 $\frac{1}{8}$ in. rim dia. Hardened steel is used for the starter gear which is shrunk over the flywheel and has 117 teeth, 8-10 pitch and $\frac{1}{8}$ in. width of face. Within the flywheel is a 11 in. dia. Borg and Beck push type clutch which drives the clutch shaft through ten splines with a 205 annular pilot bearing. The throw-out bearing is a graphite bronze shoe which contacts with the polished cast iron throwout ring on the clutch.

Design of the gear case is largely con-

ventional, although through the use of a pressed steel shifting gate assembly, the height of the cover has been reduced $1\frac{1}{4}$ in. below anything made previously by the Detroit Gear and Machine Co. The upper shaft assembly is mounted on annular ball bearings while the pilot bearing and lower bearings are Hyatt rollers.

The hand or parking brake is mounted on the tail shaft of the gear set and controlled by a direct connected face cam. Diameter of the brake drum is 6 $\frac{1}{2}$ in. and the width of the anti-friction lined brake band is 2 $\frac{1}{4}$ in.

Oiltight Mechanics universal joints are fitted to each end of the alloy steel tubular propeller shaft which is in line with the worm shaft and power plant when the car is loaded normally.

Features of Rear Axle

Two striking features are incorporated in the new rear axle. The first is the adoption of the worm drive and the second, the use of low pressure hydraulic brakes which use anti-freeze solution and develop almost complete peripheral contact. The worm drive axle was attempted by a few American cars about twelve years ago and discarded. However the tooth form of the new worm represents a vast departure from the worms of that day. In the present axle, a spiral Timken tooth form has replaced the involute form which was first introduced.

As illustrated by Fig. 14, the one piece malleable worm and gear carrier is the only cast part on the entire axle not counting the brake drums. The worm gear is special bronze and the worm is hardened alloy steel ground and polished. This assembly is fully reversible and reductions of 4 $\frac{3}{4}$, 5 and 5 $\frac{1}{4}$ to 1 are available for cars of various weight and speed characteristics.

At the rear of the worm shaft, two Timken bearings are placed back to back in a capped enclosure to take all of thrust in either direction and a portion of the radial load. At the front, a high

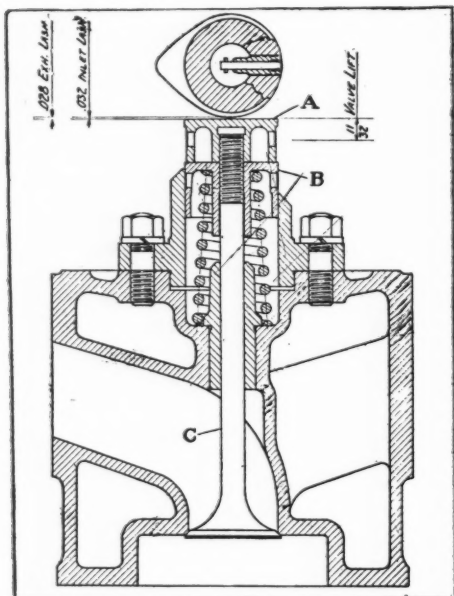


Fig. 11. Cross section through Stutz valve passage showing operating assembly and oil metering device in heel of cam.

duty Hyatt bearing carries the balance of the radial load and is located just back of a stuffing gland.

Pressed steel is used for the one piece axle housing which has a substantially square section, being fitted with welded-in lubricant dams near the differential and reinforcing sections inside of the spring pads.

At the outer end of the axle shaft, two Timken taper roller bearings are opposed at each side of a turned flange and carried in a riveted-in carrier which is closed by a bolted cap, thus relieving the differential of all side thrust loads. Packing glands are placed at both sides of the wheel bearings. Stamped steel brake carriers are secured to the axle housing by the same rivets as secure the wheel bearing enclosure. Twelve-spoke heavy artillery type wheels are mounted on a taper at the outer end of the axle shaft. Tires all around are six ply 32x6.20 in., mounted on 4½ in. Firestone rims.

Brakes of Unusual Construction

A channel shaped brake holder of pressed steel is welded to the flanged carrier. An inner flange projects out and over the inner end of the brake drum to afford complete enclosure. Beginning at this point, the braking system is a striking departure from any existing practice. A heavy rubber tube resembling a small dia. inner tube is carried in the bottom of the channel and is equipped with an integrally formed length of heavy rubber hose which includes a molded elbow. This hose connection with its elbow passes through a hole at the bottom of the brake holder and connects with the copper tube braking line on the chassis. At the top of the holder another hole is formed through which a bleeder valve passes. This valve resembles an ordinary tire valve in appearance and also is moulded with the tube.

Outside of the tube are placed six sectional shoes of pressed steel as shown by Fig. 14. Each of these comprises an inner circular shoe which contacts with the expansion tube and an outer corrugated strip which is welded on to form the circular base for the brake liners which are attached by copper rivets. Six pins of ⅜ in. dia. retain the shoes in their proper radial location and in conjunction with the flat springs shown, retract the shoes to the inner position when the brakes are released.

Brake construction is identical for all four wheels with the exception of a slight difference in carriers at the front and rear wheels. Connected with the brake pedal is a piston of about 3 in. in dia. Contrary to the usual custom, this piston does not operate directly in a close fitting cylinder with the usual ring or gland equipment. In this case the piston is carried in a cylindrical guide which serves that purpose only and the rear head of the piston bears against a closed rubber bag which is contained in a chamber to the rear of the guide cylinder. Here again the outlet elbow which connects with a combination filler, shut-off and overflow valve is molded integrally with the master rubber bag.

Brake System Completely Closed

Thus the entire brake operating system is a closed system, as the connection at the master bag joins the tubular system which connects with the four brakes. No piston and cylinder joints occur anywhere and the system requires but one filling of anti-freeze solution, following which air is bled at the valves on the expansion tubes. Maximum pressure developed in the system is about 40 lbs., and equalization takes place between not only the four wheels but all of the 24 segmental shoes.

The front axle is the usual I-section forged steel with a relatively deep drop at the center to accommodate over mounted springs, each of which is secured by two U-clips. The axle sections outside incline upward to the king bolt bosses at a sharp angle which is of value in absorbing front wheel braking strains. Reversed Elliot construction is used and the king pin is secured in the boss on the axle. Bronze bushings of 1⅜ in. inside dia. which are pressed in the ends of the yoked knuckles bear on the

king pins while the vertical load is carried on a ball thrust bearing. Brass screwed caps close the king pin ends and lubrication is provided by a Myers wick-feed reservoir. King pins are inclined outward at 6 deg. to produce practically center point steering in conjunction with a 2½ deg. camber at the wheels.

Hardened steel ball studs are used for the steering system and the ball seats are Timken type which provide practically 90 per cent contact. No cushion spring is used back of the ball seats but shims determine the relationship and a light spring is provided to prevent the rattle which would otherwise accompany the required mechanical clearance. The cross tube is one-piece tubular construction with hardened steel inserts in the expanded ends. The middle portion of the tube is utilized as an oil reservoir of large capacity and wicks convey the oil to the ball joints. With the drag link, a Ross cam and lever gear completes the steering system.

Five tubular and two channel cross members insure unusual rigidity of the frame.

Front spring horns are joined by a 1½ in. dia. tubular member, while two 1¼ in. dia. tubes connect the rear horns. Just ahead of the rear axle, another tubular member of 3¼ in. dia. has welded flanges which are riveted into the bottoms of the side channels. Another tubular member of the same dia. and with similar flanges is arched and flattened at the center to clear the propeller shaft just back of the transmission brake. A rolled steel channel member carries the radiator and front engine support and is bolted in to permit removal when the engine is to be lifted out of the chassis.

The rear springs are undermounted on the axle in a rigid fastening and are located inside of the frame side members. Brackets including Myers reservoirs are riveted on the back of the heavy intermediate cross channel and the spring eyes all around are bronze bushed. Shackles at an angle of nearly 45 deg. are placed at the rear ends of the rear springs and here again reservoirs are cast in the spring horns. Rear springs are 62 in. long and 2¼ in. wide and are made of chrome vanadium steel, the number of leaves varying from 10 to 14.

Front springs are made of the same material and have the same width as those at the rear, the length being 38 in. The number of leaves varies from 10 to 13 depending upon the type of body.

The drop at the front end of the frame is concealed by box shaped dust pans and a splash guard is fitted to the front cross channel. Watson Stabilators are fitted as standard equipment all around with those at the rear attached inside of the side members. The battery is located under the left end of the front seat with the tool box on the right side. A Prest-O-Lite battery of 160 amp. hrs. is standard equipment.

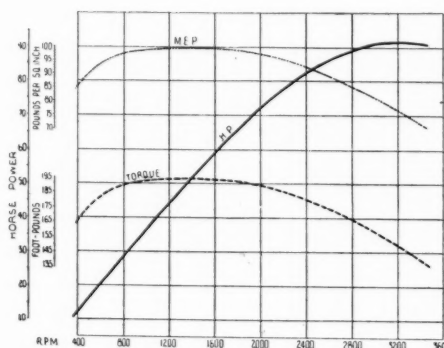


Fig. 8. Power curve of new Stutz engine. Maximum of 92 h.p. is obtained at 3,200 r.p.m.

BILL FIXIT STORY No. 14

PREVIOUS installments in this series by A. H. Packer were published March 19, April 2, April 16, May 7, May 21, June 18, July 30, August 13, September 3, September 24, October 22 and December 10, 1925.

SYNOPSIS: Bill Fixit's electrical trouble shooting men start on a trip in a Speedway car. They stop at various places along the way and in a mining community are robbed of all their money. This necessitates getting a job with the local electrician, to whom they give some helpful information gained in working in Bill Fixit's garage. Directional radio is used by government agents in locating a gang of crooks and the boys' money is recovered. The trip is continued and the night after leaving the mining town they stop with Barney Oldfield Smith, an amateur race driver and help him with a magneto job, where a new condenser is needed. The condenser is obtained from Bill Fixit's electrical station, but in the meantime Valvy discovers an old radio set, and the Red Head engineers a trouble shooting job on the set and restores it to its original usefulness. After recovering from the excitement of getting the radio set to working they settle down on magnetos again and give Barney some good pointers.

"SOMETHIN'S gotter be done," roared the Burley One, leader of the gang, as followed by his three road workers he stamped into the superintendent's office.

The superintendent received them in his usual suave manner. "What can I do for you, gentlemen?" he asked.

"Somethin's gotter be done," the Burley One repeated. "These contraptions we gotter use gettin' snow off the roads are too hard to start. With no starters and on a cold morning when a young blizzard has blocked the roads, the farmers want action. Your job's no better than ours next election, if we can't give a little service."

"But what can I do?" said the superintendent, beginning to get a little hot under the collar. "We've tried all the garage men around here. They have all taken a shot at the magnetos to the tune of a hundred dollars or so, and look at them now. No better than before."

"I tell you what," said a little fellow standing by the door. "I drove by the Smith farm this morning, and that young nut that drives around in a speed buggy all the time has hung out a sign which says he is taking electrical jobs on tractors and automobiles. Perhaps he could fix up our road machinery so it would start easier."

The Burley One laughed long and loud, but the superintendent considered the idea. "It might do no harm to try him," he said. "We have done everything else. Perhaps from fooling around he has learned something useful. You never can tell."



The phone rang that morning while Barney, the Red Head and Valvy were practicing a line plunge through an ample stack of buckwheat cakes, Valvy leading the attack, but ably assisted by his interference. Barney answered the bell's insistent ring and came back beaming. "The first job," he said, "and a big one. The engines in the road clearing equipment that the county uses start hard and it's up to us to fix 'em," and then the joy gradually died from his face as he began to realize that he hadn't the faintest idea how to start.

"Sure," said Red. "Impulse couplings 'll fix 'em up most likely."

"Yeh, impulse couplings, that's what I thought," alibied Barney as he came back to the pancake job. "We can order 'em from Bill and in a day or two we can tackle the work. But before another job comes in that stumps—I mean before you fellows go away I want you to show me some more about magnetos. The other day we talked about taking 'em apart but we didn't go far enough to cover all details of the job."

When breakfast was over the Red Head sent a wire to Bill for the impulse couplings they would need and then

Overhauling the Magneto

The Red Head Brings Out Some More Points That Are Sometimes Overlooked in Working on a Repair Job

By A. H. PACKER

got out his diagrams and test sheets to give Barney some more help on magneto overhauling.

"The last time we were talking about testing we considered a simple way of testing the armature of a magneto. Now we will consider the circuits we need (Fig. 1) for testing a coil such as we find in Dixie magnetos.

"When the Dixie magnets are laid to one side or removed entirely, the coil is made accessible and can be taken off to be tested, the condenser being also removed at the same time. As in a battery coil, it is necessary to send current through the primary and provide a place for the spark to jump. A gap is easily constructed as shown with a short piece of stiff wire. The coil terminal shown going to battery is the one usually grounded. The interrupter used for this test is shown as having its own interrupter which will need a condenser.

"This condenser can be the regular one from the magneto or a condenser from some battery ignition system. If any other magneto is ever encountered which has a detachable coil it could be tested in similar fashion after first testing to locate the primary and secondary circuits.

Testing the High Tension Insulation

"In the high tension magneto an armature or a coil has generated in it the high voltage which produces a spark

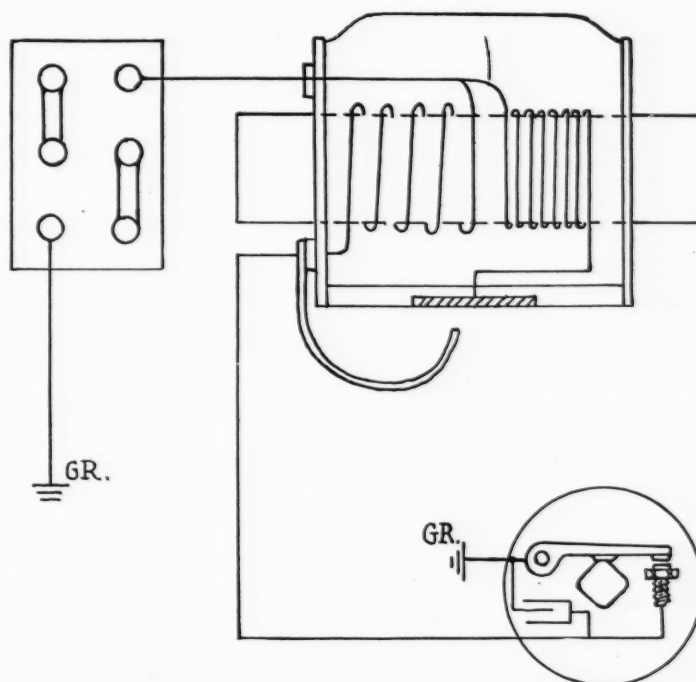


Fig. 1. Testing Dixie coil with battery current.

at the plug, but this high voltage can accomplish nothing if at any point the insulation is defective. With a good armature, there may be no spark available if the high tension brush holder is punctured, or if the same thing happens to the high tension pencil or the distributor.

"It is accordingly wise to test these parts while the magneto is apart, and if no special equipment is available, the old standby, a Ford coil, can be pressed into service, with a twelve volt battery used if necessary and strong spring tension on the points to get a very high voltage spark. The Ford coil," continued Red, "can be used as shown in this sketch of Bill's (Fig. 2) where he shows a six volt battery. One terminal of the battery connects to the lower coil terminal and the other through a switch to the upper terminal at the side.

"It's a good idea to use a safety gap between the high tension terminal at the side of the coil and one of the other terminals and then if this is made adjustable the high tension test voltage can be varied. In the sketch (Fig. 2) a high tension distributor brush holder is shown being tested. With the safety gap set at one half inch sparks should jump in this gap while the loop is moved over the high tension surface. If there is a crack at any place it will be shown by a heavy spark jumping through which will stop the sparks at the safety gap. At the end of the distributor brush holder and at the brush, sparks will, of course, jump, but they should not jump anywhere else."

"Looks as if we've figured on everything that can be done to the pieces," said Barney. "What tricks do you have up your sleeve when it comes to putting the machines together?"

"Oh, several," said Red. "We first grease the bearings with hard oil. Vaseline is often used but is a little too soft and melts out when the engine heat warms up the magneto. Aside from that I think that timing the inter-

rupter with the armature is the first important detail in assembling the magneto.

"Men in the small shops to which Bill Fixit sells parts often write to us that they have repaired a magneto, every part tests O. K. and yet the spark is weak. The chances are that the points open when the alternating current is not at its maximum. The right point is usually obtained when the armature or inductor as the case may be, is just leaving the pole tip.

"A way of checking this in Dixie magnetos is shown in this sketch (Fig. 3) where a buzzer and some dry cells are shown in series with the coil and interrupter circuits. When the interrupter points touch, the buzzer lets you know about it. The shaft of the magneto is then turned in the normal direction until the buzzer stops and at this instant the gage should just slip in between the inductor and the pole piece.

"If the setting is not right it can be changed by loosening the screws shown in this other sketch (Fig. 4). With these screws loosened the relation of interrupter to inductor may be varied until the proper setting is obtained (Fig. 3), after which the screws can be tightened.

"In the armature type magnetos it is usually not possible to change the relation of interrupter to armature, for a keyway is usually milled in the armature shaft into which a projection on the interrupter fits. The roughneck mechanic usually gets things wrong if at all possible, though," said Red, "for I have seen interrupters forced on with the key not in the keyway, with the result that the interrupter would wobble around and the points would open at the wrong time.

"The right way is to put the interrupter in place and turn it slowly, until you feel the key drop into the keyway. Then put the interrupter screw in place and tighten it. The relation of armature to pole piece when the contacts separate will be approximately as shown in this sketch

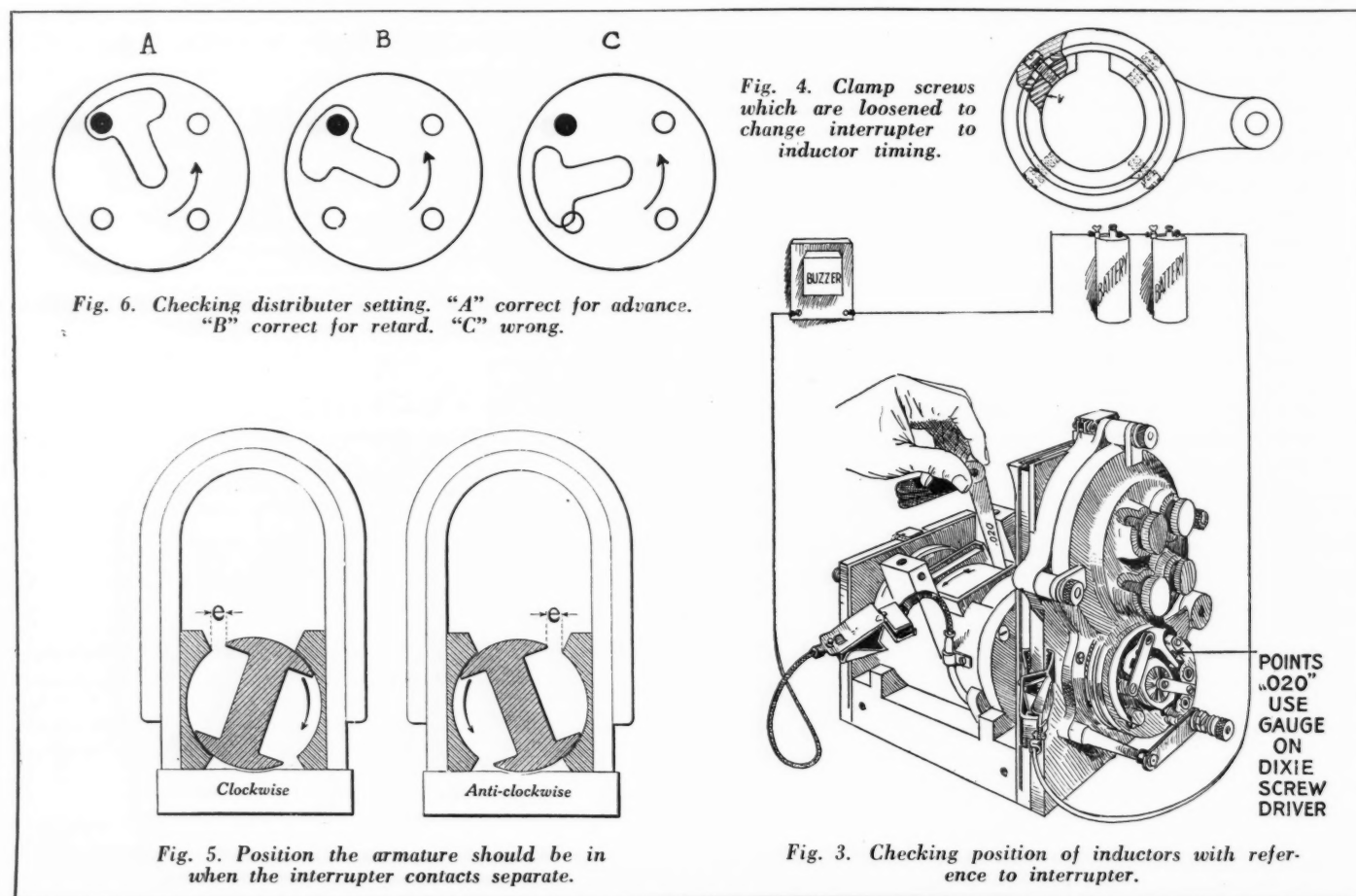


Fig. 4. Clamp screws which are loosened to change interrupter to inductor timing.

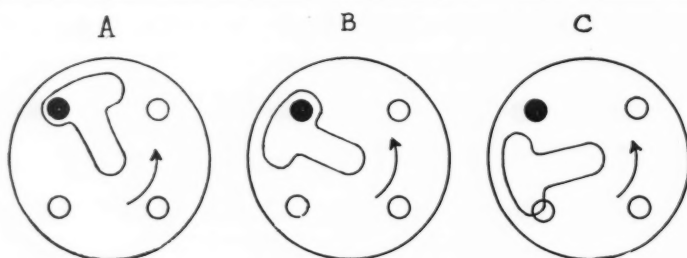


Fig. 6. Checking distributor setting. "A" correct for advance. "B" correct for retard. "C" wrong.

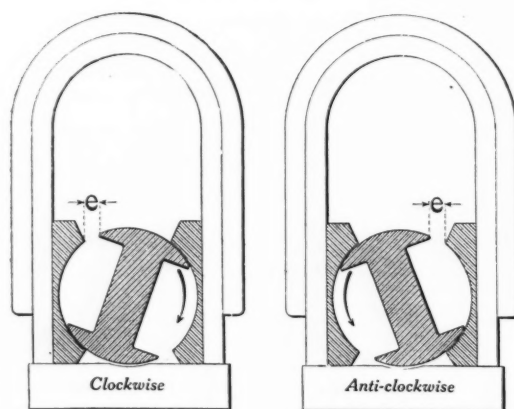


Fig. 5. Position the armature should be in when the interrupter contacts separate.

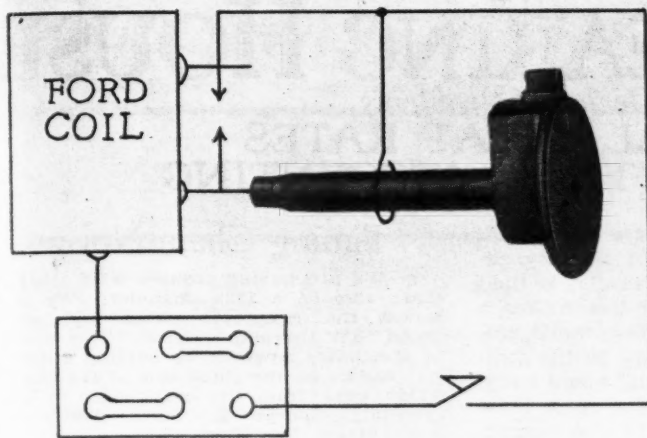


Fig. 2. High tension insulation test, using a Ford coil.

(Fig. 5) where at the left a clockwise magneto is shown, while at the right is an anti-clockwise magneto.

"With the conventional magneto this distance marked 'e' will vary as the spark is advanced and retarded, the spark intensity accordingly varying somewhat in the different positions of the spark advance lever. This is the reason that the spark is sometimes advanced to crank an engine, although it is done at the risk of having the engine kick back, for the magnetos are usually so built that the advance or normal running position gets the hot-test spark. With impulse couplings such as we intend to install on the big snow sweepers, there is no danger of this occurring and no trouble getting started.

"When we put the magneto together it is necessary to check up the distributor to see that it is properly timed with the interrupter. After the end brackets are on it is

often impossible to change the timing so it has to be checked as soon as the end brackets are put in place and while they are held there by hand or with one or two screws, temporarily used.

"It is dangerous to depend on marks on the gears for they may be in the wrong place, perhaps put there by repairmen not thoroughly acquainted with the tricks of the trade that the electrician should know. This sketch (Fig. 6) shows how the distributor brush should check up under various circumstances.

"At 'A' we have conditions as they should be when the interrupter points just begin to separate with the advance lever in the advance position. The distributor segment has just slid under the brush connected with one of the spark plugs and is just making a full contact with it. When the spark is retarded it occurs later and the distributor will have rotated farther as shown at 'B.' The distributor brush and segment are still making contact although a little more rotation will separate them.

"If the condition at 'B' exists when the interrupter contacts separate, with the spark lever in the *advance* position, then in the retard position the segment would be all the way out from under the brush as shown at 'C.' Under these circumstances we would not only fail to get the spark at the **proper plug**, but the timing would be so far out that the spark would go to the wrong plug.

"A magneto timed this way would not start in the retard position for it would continually fire in the wrong cylinder. It could be started in the advance position if it could be cranked without kicking back but when the spark was retarded it would pop in the carburetor and quit. That shows how important it is to get the distributor timed right.

NOTE: The subject of magneto overhauling will be concluded in the next Bill Fixit story. It will include two methods of remagnetizing the magnets.

Chrysler Brings Out More Powerful Six

(Continued from Page 12)

is carried in a straddle type of mounting two taper roller bearings being employed on the shaft proper and a parallel roller bearing in the overhung support. Timken taper roller bearings are used to support the four pinion differential while the outer ends of the axle shafts are carried likewise. The shafts made of 3240 S. A. E. chrome nickel steel are $1\frac{3}{4}$ in. diameter at the wheel end and $1\frac{1}{2}$ in. at the ten splined ends.

Similar in construction to the smaller six, the front axle is tubular being designed for great torsional strength. Yokes and spring pads are forged, the latter being machined in place on the heavy wall $2\frac{1}{2}$ in. diameter tubing.

The steering unit is a specially made cam and lever Ross gear employing a radial thrust ball bearing at either end of the cam. The steering wheel is of walnut including the spokes and has a 17 in. diameter.

Springs of the semi-elliptic style made of chrome vanadium steel are employed all round, those on the front axle being $41\frac{1}{2}$ in. long and overslung while those on the rear are underslung and 58 in. long. All springs are $2\frac{3}{4}$ in. wide. Spring covers holding a sufficient quantity of lubricant for several months are also provided all around.

Except for slight modifications and improvements, the design of the hydraulic four wheel braking system is the same as that employed on the smaller six, being of the external contracting type. The drums which have the same dimensions front and rear are $14\frac{3}{8}$ in. diameter by $2\frac{3}{8}$ in. wide. With a brake lining $1\frac{3}{4}$ in. wide, the total braking area is 249 sq. in. Lining thickness is $\frac{5}{32}$ in. The master cylinder is placed on the transmission case in the conventional method and the wheel operating cylinders are the same size on both axles.

The frame employs pressed steel side channels 7 in. deep by $2\frac{1}{2}$ in. wide and made of $\frac{5}{32}$ in. stock. Between the front and rear spring hangers, 2 in. diameter tubular torsional members are employed. There are also three pressed steel cross members, the forward one carrying the weight of the engine being $5\frac{1}{2}$ in. wide with the center one $4\frac{1}{4}$ in. wide and the rear member $4\frac{1}{2}$ in. wide.

Standard tire equipment is 32 by 6.20 in. straight side Seiberlings mounted on 12 spoke special Kelsey wheels having $4\frac{1}{2}$ in. rims.

Both open models are built by Chrysler and all bodies are given a pyroxylin base finish. The phaeton is painted above the black bead in a mallard green and the

lower part is crane gray. The upholstery is of genuine brown leather with black binding to give a two-tone effect.

Above the maroon beading the roadster model is finished in sheraton gray with the lower part silver gray and the spokes of the wire wheels to match the upper part. Colonial grain upholstery in the French pleat style is used for the cushions on both the front and rumble seats, the latter being fitted with a self locking type of arm rests. Both the top and windshield are easily detachable, the natural wood end top bow fitting into nickel plated thimbles.

Both the 5 and 7 passenger sedans have the same interior fittings except the larger model has auxiliary seats. Both cars have a black upper structure with the 5 passenger model using a cactus gray finish below the beading and a pueblo gray employed on the larger car. Upholstery is in broadcloth with striped material on seat backs, cushions and side arm rests.

The berline has the same specifications except for the curved glass partition which drops down into back of front seat. A dictaphone is also provided. The front compartment is trimmed in long grain black leather. On the coupe the upper

(Continued on page 34)

The READERS' CLEARING HOUSE

Questions and Answers on Dealers' Problems

**BUILDING - ELECTRICAL - FLAT RATES
SHOP - LEGAL - PAINT & TRIM - ACCOUNTING**

A Click in the Clutch

Q—We have a 1924 Big Six Studebaker in our shop which with the motor running with clutch disengaged at a speed of 200 to 300 r.p.m. has a sharp dull click. When running about 500 r.p.m. it is not noticeable. This noise sounds like a valve tappet, but we have set tappets as close as possible. Would you think that a little play in the timing gears would cause this noise.—Frahm Brothers Garage, Manning, Iowa.

From your letter it seems that you are not sure as to the location of the noise. If it really is in the clutch it is possible that the three toggle levers which operate against the clutch shifter bearing do not touch at the same time. Possibly two of them are operating the clutch and the third one is loose and makes this clicking or rattling sound. If the noise is stopped by operating the clutch pedal and then is produced by pushing the clutch pedal down again, it would seem to prove that the trouble really is in the clutch. The clutch is properly adjusted as follows:

The clutch pedal should be adjusted so that the clearance between the under side of the clutch pedal pad and the toe board is five inches. This can be adjusted by loosening the clamp screw and the adjusting screw at the lower end of the pedal arm and moving the arm until the clearance is correct. Then tighten the two screws.

If this adjustment brings the pedal arm closer than $\frac{1}{2}$ inch to the under side of the toe board, it is too close and should be readjusted to give this clearance. Then loosen the nuts holding the pedal pad in the upper end of the pedal arm and screw the pedal pad in or out until there is 5 inches clearance between the pad and the toe board. Be sure to tighten the lock nuts after adjusting.

The clutch toggle levers are correctly adjusted when from one-half to one inch movement of the clutch pedal is required to bring the clutch shifter bearing into contact with the toggle levers, all three toggle levers touching the shifter bearing at the same time.

To make the correct adjustment press down the clutch pedal and place a block or piece of metal $\frac{1}{8}$ of an inch thick behind the shifter bearing housing at point "A."

Then, one at a time, loosen the toggle lever adjusting screw lock nuts and turn the adjusting screws in or out until the levers are all just in contact with the shifter bearing. Be sure to tighten the lock nuts and remove the block from behind the shifter bearing housing.

If the trouble is not in the clutch then you might try running the engine slowly and holding a screwdriver against the valve stems or against the valve tap-

pets, one at a time to see if this affects the condition. You might also try adjusting the valve tappets absolutely tight one at a time to see if this makes a difference in the noise. This would produce a continuous pressure on the camshaft at different places and would temporarily eliminate noise due to a loose camshaft bearing. It might also temporarily eliminate noise due to a worn valve tappet.

WHITE VALVE TIMING

Q—A few weeks ago you showed the valve timing of a 16 valve Pierce-Arrow truck engine also a 16 valve White touring car engine. We would like to have the valve timing of the White 1917 touring car engine.—Bennett Motor Co., Silver City, N. M.

In 1917 there were three engines used. The 16 valve engine known as model G. M. had the exhaust close 10 deg. after top dead center while the intake opened on top dead center. Model G. E. C. had the exhaust close on top dead center and the intake open 5 deg. after top dead center. Model G. K. has the exhaust close 5 deg. after top dead center and the intake open 10 deg. after top dead center.

The Readers' Clearing House

THIS department is conducted to assist dealers and maintenance station executives in the solution of their problems.

All questions are answered direct by letter, so the name and address should be given in full. This saves waiting for the answer to be published, which sometimes occurs several weeks late, depending upon the space available.

Readers' names will not be published with articles, if a request to this effect is received with the letter.

Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegram.

Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.

Addresses of business firms will not be published in this department but will be supplied by letter.

Technical questions answered by B. M. Ikert and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin; Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.

Timing Chain Noisy

Q—We are having trouble with timing chain slap on a 1922 Chandler. We removed the generator chain and still found that the slap existed. This could be eliminated however, by holding a hammer handle on the slack side of the chain which goes from the crankshaft to the camshaft.—George R. Tufts, 14227 W. Friar Street, Van Nuys, Calif.

On the 1922 Chandler there is no adjustment to the chain and when wear has taken place it is necessary to remove a link or half link and then when more wear takes place it is necessary to install a new chain. We understand that you have installed new chains and still have trouble. A chain is considered to have the right tension when you can squeeze the two sides together and reduce the distance from one side of the chain to the other side by one half inch.

If the chain is still too loose after new ones have been installed, it is possible that the center to center distance between crankshaft and camshaft has been reduced by excessive wear in the main bearings. There is, of course, always some tendency to produce timing chain slap due to the fact that the camshaft first jumps ahead or tries to and then holds back as various cams receive the thrust from the valve springs. This has caused one maker of motor cars to install a camshaft brake to eliminate this back and forth rocking tendency.

Another possibility is that looseness in the camshaft bearings or valve tappets contributes toward this condition. The main bearings are of the replaceable type, but unless new main bearings would increase the center to center chain distance considerably, this would probably have but little effect.

TIMED WRONG AND ENGINE POUNDS

Q—We have a 1924 Chandler on which the timing chain has slipped a few teeth and we are unable to get the valves set right. This is a Pikes Peak motor and when you accelerate, the motor pounds like the bearings are loose. Advise what to do to get the valves timed right.—E. O. Gerken, 3254 Glenwood Avenue, Toledo, Ohio.

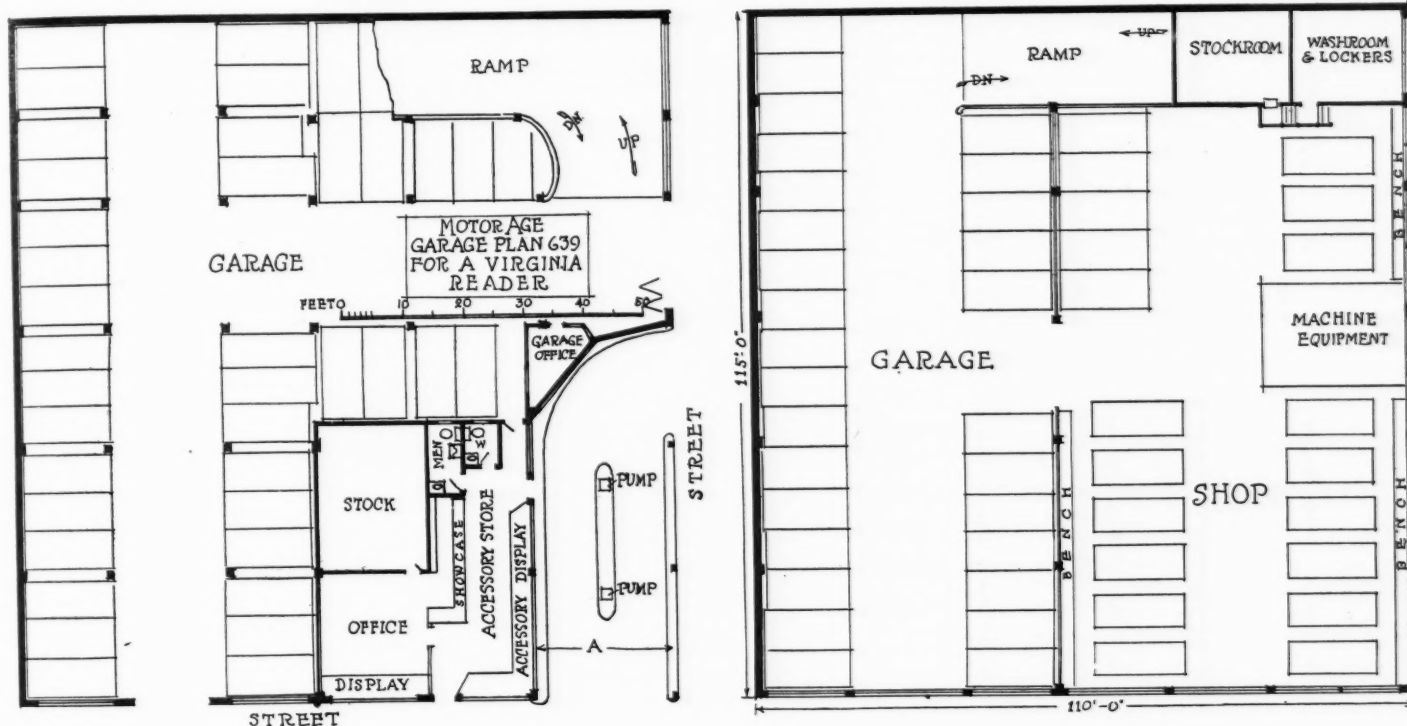
The timing on this motor is conventional and the exhaust valve should close when the piston is on top dead center or has barely started down again. We do not believe that improper valve timing would cause pounding such as you describe, although this might be possible if the ignition is improperly timed and the spark occurs too soon. We would recommend checking up the main bearings after the timing has been corrected, assuming that this does not eliminate the difficulty.

Planning Your New Building

By TOM WILDER



Two Story Concrete Building with Ramp



The big problem in a building of this kind is to locate the ramp where it can be approached and left without impossibly short turns or too much waste of storage space.

Q.—I am contemplating building a combination two story concrete garage, service station and gas station with ramp (no elevator) to second floor on a piece of land the size as shown below, 110 by 115 ft.—Virginia Reader.

We would ask readers of this department to read the above letter as an example of what not to do when asking help. There is only one chance in a hundred that we have given him what he wants simply because he is so stingy with his information and we would not publish the plan except that it might help someone else.—Editor.

You have given us so little information about the nature of the business you intend to handle in this new building, that we have been obliged to use our imagination to a great extent. Perhaps if we have not laid it out according to the purposes for which you intend to use it, it will still be somewhat subject to changes without material alteration of the construction. The 50 ft. wide garage section with the entrance on both streets and the ramp from first to second floor might be permanent while the space devoted to the accessory sales, filling station and shop could be made smaller or larger as the conditions might demand.

The filling station is as narrow as could be well used and it would be advisable to leave more space making the dimension A four or five feet greater than it is. You will note that the second floor

will have to be carried on columns, but that the second floor itself will be column free with the exception of the row through the center which forms a division between the two sections. The roof should be supported on trusses and

supplied with some skylights, especially for the shop.

The stock room and shop toilet are located above the ramp and are elevated above the second floor level to give headroom for cars on the ramp.

LEGAL QUESTIONS ANSWERED

By WELLINGTON GUSTIN

of the Chicago Bar

MAY SELL AFTER JUDGMENT

Q.—We have in our possession a car left for repairs on March 5, 1924. They refused to pay the repair bill and storage or to permit me to sell it for these charges. I have letters in which they gave me authority to repair the car and in which they wanted to compromise on the storage bill. Now I cannot get them to answer my letters. Please give me the Alabama laws in regard to this case and what to do to get my money.—Fred Marthaler, Leighton, Ala.

Retaining possession of the car under claim of lien does not prohibit your bringing suit and reducing your claim to judgment, then selling the car under the judgment. It appears that this would be more effective under the circumstances, since you have no statutory lien in your state covering the garage man. The common law lien under which you

may retain possession does not permit you to sell the property. But you may sell after judgment.

WRITING IS BEST EVIDENCE

Q.—Have you an available draft or form for a contract which two or more partners would sign, obligating each to the other, their creditors and the public they would serve as a partnership, without incorporation? Could you send me something to give me an idea as how to draw up such a contract?

A partnership agreement need not be in writing, though the writing is best evidence of what the parties have agreed to. No formality is needed, but a concise statement of your interest and responsibility to each other, length of agreement, division of profits, losses, and purposes are the essential elements.



Defeating Old Man Wear and Tear

Engine Balancer Must Be Properly Timed

Q.—Supply information about a Stearns Knight balancer on a 4 cylinder 1925 car. We had one of these cars burn out the No. 3 connecting rod bearing and we fitted a new one but the car developed a knock as soon as the engine was started. It looks as if something is loose or running out of true and it seems as if it knocks twice in each revolution. We found the center main bearing on wrong, the oil hole being on the wrong side so that the bearing did not get oil.

The balancer is used on Willys Knight cars and not on Stearns Knight cars so we assume that you were working on a Willys Knight. The balancer consists of two cylinders which rotate in opposite directions at twice crankshaft speed, being geared to each other and to the crankshaft. The cylinders have holes drilled lengthwise in them and they are correctly installed when the holes are up and accordingly the heavy portion down with the crankshaft verticle, that is, the piston on dead center.

It does not matter whether the No. 2 and No. 3 pistons are up or down just so it is the dead center position when the teeth are meshed. If assembled in one position, it will be found that the heavy portion of each cylinder is again down when the crank has been turned one half revolution which gives the other dead center position.

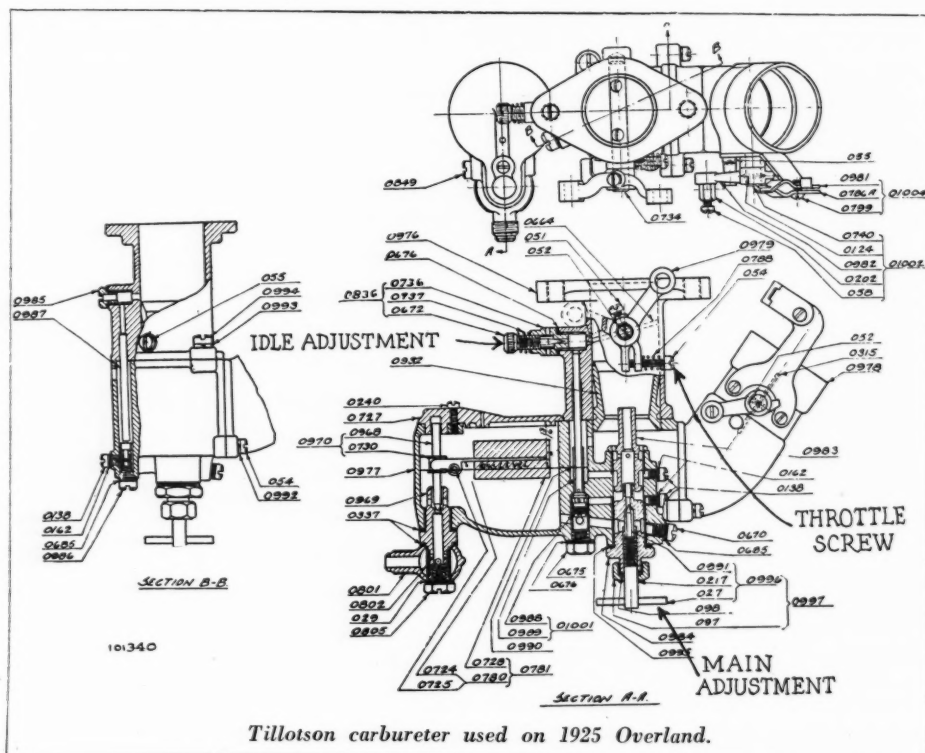
Q.—Explain adjustment of the Tillotson carbureter on a 1925 6 cylinder Overland.—Geo. Podlosck, 214 So. 9th St., Reading, Pa.

Sectional views of this carbureter are shown giving the idle adjustment, the main adjustment and the throttle screw position. This instrument has two adjustments—the by-pass adjustment for idle and low speeds, and the needle adjusting screw for medium and high speeds. Knurled screw No. 0672 governs the idle; turning clockwise makes it richer, counterclockwise leaner. The approximate setting is one turn open. The throttle lever screw No. 054 should be adjusted at same time to give required engine speed; turning clockwise increases engine speed. The main flow of fuel is governed by plug 0984 and needle valve 0996. Turning to the left opens the adjustment and increases the flow of fuel. The approximate setting is two turns open. Before adjusting carbureter, spark plugs, ignition system and valves should be in good order and gasoline line and strainers free and clean.

RUNNING EXHAUST THROUGH A HALF INCH TUBE

Q.—Could you give me the name of some firm that could furnish copper tubing, also connections as used for oil lines in a crankcase? At what engine speed would a ½ in. copper tube carry to the exhaust of a Buick 6 without danger of bursting the tube?—Vernon Hoblet, Willshire, Ohio.

The names of several concerns are being given by letter. You do not say



Tillotson carbureter used on 1925 Overland.

what you wish to use the copper tube for. We assume that you are making up a hot spot device of some sort using exhaust gas for heating it. You could not run all of the exhaust gas from any car through a ½ in. copper tube and still have the engine operate properly. The size would be so small and the back pressure so great that the engine would not work right. We do not believe, however, that it would burst the tube for pressure is not sufficient. To operate a device of this sort you should tap into the exhaust manifold or exhaust pipe and put a scoop on the inside so that a portion of the exhaust gas will be carried out and go through your copper tubing. This is done on certain hot spot devices which are used to improve carburation.

The Radiator Does the Charleston

Q.—We are having a great deal of trouble lately with a car equipped with an eight in line engine. The trouble has to do with the shimmying of the radiator. We feel this is due to the very long hood and suggested putting two braces running from the radiator back to the dash but the customer objected.—M. D. Leasure, 418 Laurel Blvd., New Castle, Pa.

This condition seems to be due to the combined results of balloon tires, three point suspension and extra long engine and hood. It can be overcome by steadying the radiator or the engine. In some cars cross rods are now being used, one running from the left side of the radiator

to the right side of the dash and the other from the right side of the radiator to the left side of the dash. The two rods are then clamped together at the center where they cross. This overcomes the effect dut does not get at the cause. Another method is to steady the engine with respect to the frame which in effect gives four point suspension instead of three point. On one make of car, however, this has been tried out over rough roads and seems to prove perfectly satisfactory giving very steady operation where before a considerable amount of shimmying was experienced.

We understand that the factory which makes the car to which you referred in your letter can now supply brackets for steadying the front of the engine to the cross member of the frame. Referring again to different methods of steadying the radiator, we might point out that on one car a heavy channel iron extends from the dash to the radiator.

Q.—On a 6 cylinder Auburn we are troubled with a clicking sound in the clutch, which is only heard when the car is running slow in high gear and when idling. It sounds like four light taps every revolution of the clutch.

It is possible that this is due to the contact of the clutch throwout fork with the lugs which operate the clutch throwout bearing. If the two arms of the fork do not strike at exactly the same time it may cause this clicking noise. We understand this may be remedied by using a file and filing off the arm which touches first so that both will touch at the same time.

Clearing Up Electrical Troubles

EDITED BY A. H. PACKER



Charging Batteries With the Farm Lighting Plant

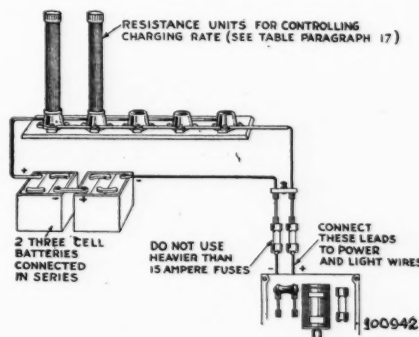
Q.—I am a subscriber to your magazine and note that you help those who write you for advice. I have a Delco farm lighting plant, 32 volts D.C. 850 watts. Now, I want you to tell me the correct way of charging storage batteries as used on automobiles with this plant. At times I have occasion to charge only one battery and again I may want to charge several. Please tell me how to wire the charging wires in order to charge only one battery and several. How many batteries can I charge on this plant at once.

At present I have 250 watt lamp connected in series with the battery to be charged and this gives a charging rate of about 7 or 8 amps. But should I want to charge more batteries will not the charging rate be lowered. Now, after you have told me how to charge several batteries at once, tell me this, Will the voltage affect the charging in any way? That is, if more than one battery is charged, will the voltage drop too low? And, on the other hand, if I charge only one battery will not the voltage be too high, the plant being 32 volts.

I have been told that it is better to have several lamps on the line, but will not this drop the voltage too low? Any service you can render me will be more than appreciated and in answering, please write to me direct and include a drawing of just how such an arrangement should be wired. Is there an instrument of any kind that can be had that is suitable for controlling the charging rate and is connected in the circuit doing the charging? —Curtis A. Johnson, Johnson Service Station, Hochheim, Texas.

We are showing two illustrations, one of which gives the wiring diagram and the other is a chart showing approximately the amount of charging current when various numbers of resistance units are used. These are resistance units supplied by any authorized Delco farm lighting representative. You can of course, use lamps in place of the resistance units if you wish. You can also cut the wire between the battery and the switch and connect a Ford ammeter or any other ammeter in the circuit to see how much current is flowing. Then merely add more lamps or bigger lamps to increase the current. The more batteries you connect the less current you will have while the more lamps or resistance you put in parallel as shown in the diagram the more current you will have.

It is apparently out of the question to charge more than five, six volt batteries at a time, for this gives 30 volts and the voltage of the charging current is only 32. Even under these circumstances it might be necessary to run the plant while charging in order to get adequate current.



Connecting batteries for charging from a 32 volt system.

Cells to be Charged														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	1	1	2	2	2	3	3	3	4	4	4	4	4	4
Approximate Charging Rate—Engine Running														
525	5.5	5	8.5	7.5	7	9.5	8.5	7.5	8.5	7.5	6.25	5	4	3
Approximate Charging Rate from Delco-Light Battery														
4.5	4.25	4	7	6.5	6	8	7	6	7	5.5	4.5	3	2	1

Approximate charging current obtained with charging resistances.

Turn on Lights When Installing Battery

Q.—I have a National Highway six automobile, 1917 model with Westinghouse starting and lighting device on same. I bought this car second hand, with battery in, and drove it 6,000 miles without battery being touched. At that time the battery went down and would not charge up, so I bought a new battery and put it in the car myself, with negative end grounded on frame and positive end connected in line to lights and starter. Upon starting the motor, the ammeter registered discharge; and upon stopping the motor and turning on lights it showed charge.

I then tested the battery to see if the terminals were marked wrong and they were O.K., according to the salt water solution. I then tested out the old battery and found, according to the salt water solution, it had been connected up with the positive end on the ground and the negative end on the line. I therefore reversed the wires in my ammeter to register properly and have driven 16,000 miles since and everything is still O.K.

Now, I am told by some that this battery condition could not have existed as I state. What would take place in this case with the battery turned around as I state the old one was. This is a single wire circuit. Would the generator be affected in a case like this? I am advised generators of some makes would be ruined under these conditions. After putting in the new battery, the ammeter showed from three to five amperes more charge than the old battery did—A. M. Ikenberry, 1002 N. Penn Ave., Mason City, Iowa.

Ordinarily it does not make any difference which end of the battery is grounded. The wiring diagram for the 1917, 6 cylinder National car shows the positive grounded. It also shows the gen-

erator as being of a type which included a voltage regulator. Some of these regulators were made with two silver contacts at the regulator side. Others were made with one silver and one Tungsten contact and with these it was necessary to have the current go in a certain direction across the points. Consequently if your generator had a regulator of this type with one Tungsten and one silver point and you reversed the battery it would theoretically oxidize the Tungsten contacts and make the generator stop charging after running about one half hour. As you mention no trouble due to the generator failing we assume that the regulator must have had two silver contacts.

Aside from this condition there is practically no possibility of trouble and if you close the cutout points by hand after the battery is installed it will automatically magnetize the generator in the proper direction. When you first connected up the battery it was really being charged although the ammeter said discharge. Your reversal of the ammeter wires was one way of correcting the condition. The other way would have been to reverse the battery.

As a precaution it is always advisable to turn on the lights and make sure that the ammeter shows discharge whenever a battery is installed. The difference in the charging rate when the new battery was put in was doubtless due to a difference in the voltage and the fact that the voltage regulator would thereby permit a different current to flow.

HOME MADE RECTIFIER NOT SO GOOD

Q.—At one time in Motor Age I saw a description of a lead-aluminum chemical rectifier and I wish you could give this information again as I would like to make one to charge batteries.—Harry B. Brown, Box 115, Eldon, Iowa.

We are giving you some recommendations by separate letter. In general we do not believe it advisable to try to make this kind of rectifier as it is very inefficient. It also requires about as much current as would be used with a good efficient rectifier in charging eight or ten batteries. In addition it is necessary to have glass jars, lead plates, aluminum plates, and other items and by the time these are purchased and a lot of time has been spent in assembling the outfit you would find it would cost considerable and would then not be satisfactory.

The article in question however was published in the August 22nd, 1918, issue of Motor Age and other references may have appeared since then. If only one battery is to be charged at a time it is well to get a good commercial rectifier.



Motor Age's Flat Rate Forum

EDITED BY B. M. IKERT

Flat Rate For That "Mysterious" Case of Trouble

ALMOST always in circles where flat rate is discussed someone brings up an objection that flat rate does not take care of the job that is hard to diagnose and for which there is no definite labor operation or cost listed on the flat rate schedules.

For example, recently a man who operates a repair shop said that he could not get "sold" on flat rate because it was not applicable to so many jobs that came into his place of business.

As in almost every other line of endeavor there is always the proverbial exception to the rule. And so, no matter how well organized a shop's flat rate system may be there always will be some job popping up for which the flat rate book has made no provision. But this is no reason why the flat rate system as a whole should be chucked into the waste basket as not having sufficient coverage.

If any flat rate system were 100 per cent perfect, we should have no further need for service managers. When the infrequent job not listed in the flat rate schedules comes up, someone in the organization must be qualified to analyze the conditions and establish a price accordingly.

Often the objections raised to the establishment of flat rate prices for repairs are caused by another factor and that is improper trouble shooting. Certainly it is not the customer's fault if a shop spends a day locating a certain trouble that requires but a few minutes to remedy, once it is found. We frankly



THINGS THAT HELP FLAT RATE

So many of the flat rate operations require less than an hour to perform and in order to handle such jobs very quickly many of the larger service stations have installed "quick service yards." Thus the customer does not have to drive into the building, there is no tie-up of cars and in general the service is good all around. Of course weather conditions have something to do with the proper functioning of such a "yard."

admit that sometimes a case of trouble arises that has everyone in the shop guessing and which oftentimes takes a long time to "lick."

In a shop one time a customer said that his car ran all right but that the engine overheated. Everything seemed all right so far as lubrication, cooling, carburetion, valve timing, ignition, etc. where concerned. The mechanics checked all these

things, advanced the ignition slightly, made sure there was the proper amount of water in the system, etc. and sent the customer out saying it was their belief things would be all right.

But the customer came back in a short time with the radiator water boiling hot and another council was held. Surely a strange case one would say, when everything seemed right. But there is always the one reason behind such engine behavior and this trouble was finally solved by the service manager taking the car out on the road after the engine and cooling water had been allowed to get quite cold in the shop.

When the first symptoms of overheating became apparent he stopped the car, got out and raised the hood. Then he saw. It was a hose connection closed up by suction from the water pump. Someone had put in a piece of light rubber hose which under certain conditions simply closed up and thus shut off the water circulation. The installation of the proper thickness hose cured the trouble.

It took a long time to find this source of trouble and yet the flat rate operation of replacing a hose connection amounted to only 50 cents. Certainly nobody would think of charging a customer \$10 or more for installing a hose connection. And after all, the repair or service operation, flat rate operation, if you please, was listed in the shop's schedule. The job looked mysterious and as though it was not on the books, but it was there as "Replace One Hose Connection.....50 cents."

MOTOR AGE'S FLAT RATE FORUM

No. 46

FLAT RATES FOR FORD MISCELLANEOUS ENGINE OPERATIONS

Manufacturer's
Official
Designation

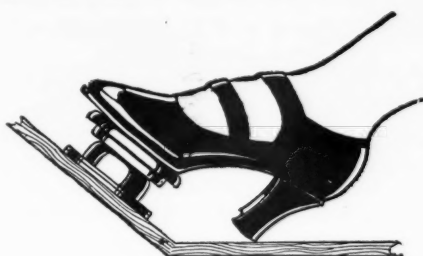
	Charge
17 Repair cylinder head bolts stripped—one or two.....	\$4.00
18 Repair cylinder head bolts stripped under dash, loosen body and move back	8.00
19 Clean out feed pipe.....	4.00
20 Replace cylinder head gasket.....	1.25
21 Replace all three hose connections.....	1.25
22 Replace one hose connection only.....	.75
23 Replace crankshaft starting pin, or pulley.....	1.75
24 Tighten motor to frame.....	2.50
24a Tighten or replace front crank case bearing cup.....	1.50
25 Clean crankcase or install gasket under lower cover.....	1.50
26 Replace manifold carburetor or bolt or repair leak in manifold.....	2.00
27 Install new butterfly spring.....	2.00
28 Overhaul carburetor—Kingston and Holley.....	2.50
29 Adjust carburetor.....	Free
30 Replace commutator wire loom.....	.75
31 Replace commutator case, brush or roller.....	.75
31a Clean commutator.....	Free
32 Replace commutator pull rod joint.....	.75

THE MARKET'S NEW OFFERINGS

Accessories—Equipment—Supplies

Bailhe Accelerator

AN accelerator which does not require an additional foot support is being made by the Bailhe Manufacturing Company, Fort Wayne, Ind. The Bailhe Accelerator employs a rocking ball point and a 3 in. rubber pad, and it is designed to provide two ranges of speed, a loafing and a sporting range with a resting point between. The manufacturers claim that perfect control of the fuel supply is obtained even over rough roads. It is being introduced for Ford cars but it is adaptable to other cars as well.



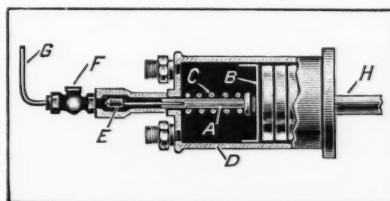
Bailhe Accelerator.

Presto Cigar Lighter Display

Metal Specialties Manufacturing Company, Chicago, offers the trade an attractive display stand on which are mounted three Presto Cigar Lighters and other items. The display contains: One No. 330 Combination 3 in 1 lighter, one No. 210 Ratchet type lighter, one No. 250 Universal Mounting type lighter, one No. 340 Bracket for No. 320 2 in 1 and two No. 245 Ash Receivers. The total retail price of these items is \$17.25 and they are priced to the dealer, with the display stand, at \$10 f. o. b., Chicago. The stand measures 12 inches wide 11 high and five deep and is finished in red, white and green.



Jiffy Battery Service showing manner of carrying Jiffy Automatic Filler and Jiffy Battery Hydrometer. To the left is the Automatic Battery Filler designed for self-service.



Self-filling Master Cylinder.

Presto Hose Clamp

THE Presto Hose Clamp is a novel accessory manufactured by the Cooper Clamp Company, 737 Park Ave., Brooklyn, N. Y. The Presto Hose Clamp differs from the conventional type in that it is made in two pieces and one clamp will fit several different diameters. This is accomplished by having a series of hooks on one of the pieces which will fit into a corresponding slot on the other piece. All diameters met in automobile practice are taken care of by three clamps. List price \$10 per 100.

Battery Service Equipment

AMONG the offers of battery service equipment are four products of the Mapel Engineering Co., St. Louis, Mo. This company's Automatic Battery Filler is primarily for self-service by the owner in water storage batteries. A nozzle is furnished which fits any standard screw top catsup bottle as a container. This is priced at \$1. Mapel Engineering also makes the Jiffy Automatic Filler for watering storage batteries. It has its own container and operates with a collapsible rubber bulb. The company recommends it for giving a maximum amount of accurate service and the price is \$1.50. The Jiffy Battery Hydrometer is said to withdraw the proper amount of solution from the battery and prevent overfilling with the consequent inoperation of the hydrometer float. The instrument can be raised without danger of leakage and the actual gravity noted at a glance. Price \$1.25. Mapel's Jiffy Battery Service, for large service users comprises, a half gallon hard rubber container and a handle for carrying outfit. It provides for carrying the Jiffy Automatic Filler and the Jiffy Battery Hydrometer and sells for \$5.

Additional Descriptions
Will Be Found on
Next Page

Self-Filling Master Cylinder

THE Mattingly Self-Filling Master Cylinder for all hydraulic brakes automatically keeps the brakes fully charged with fluid, thus eliminating the necessity of pumping additional fluid into the brakes. If any of the fluid is lost by evaporation or leaks this device automatically replaces it from the supply tank. Installation is quickly accomplished. The Self-Filling Master Cylinder is priced at \$10 and made by the Mattingly Automatic Valve Co., St. Louis, Mo.



Presto
Hose
Clamps.

Adjustable Tank and Radiator Cap

THE Automotive Specialty Corp., 47 W. 63rd Street, New York, is manufacturing the Tasco adjustable gasoline tank and radiator cap, which is made of nickel plated brass. The cap has a hinged lid and is attached by tightening a screw, no bushings or adapters are necessary. The size is adjustable and two sizes fit all cars. It is packed in individual boxes, 12 to the carton, which is of the display type. Price, 50 cents each.

Bodyguard Transmission Lining

BODYGUARD Transmission Lining, a product of the Atlas Asbestos Co., North Wales, Pa., fits all Fords, including 1926 models. The lining is made from cabled or cord yarn on a plan which is declared to give the lining particular ruggedness and durability. Besides carrying an unusual number of yarn strands the lining is six plies in thickness. Packed in sets with rivets. List for models prior to 1926 is \$2.50 per set. List for 1926 models is \$2.80 per set.

THE MARKET'S NEW OFFERINGS

Accessories—Equipment—Supplies

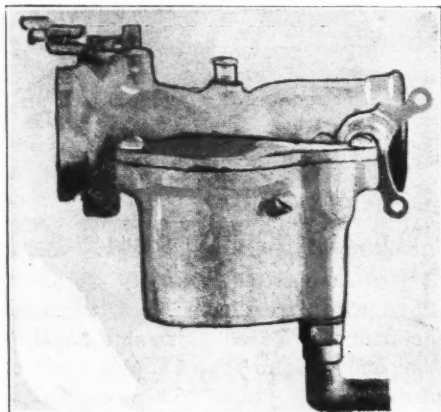
(Continued from page 29)

Bear Battery Protector

PREVENTION of battery terminal corrosion is said to be assured by use of Bear Battery Protector, a preparation put up in tube form by the Bear Manufacturing Co., Rock Island, Ill. Each tube holds enough for several applications, one application often being enough to last a year or more. A special solution in powder form to clean batteries is furnished with each tube. Tubes retail at 50 cents each.

Model "C" Haling Carbureter

EASY starting, smooth performance at low speeds, economy in fuel consumption, full power on hills and a powerful and smooth pick-up are claimed for the Model "C" Haling Carbureter. This device is made by the Haling Carbureter Factory, Rochester, Minn. Model "C" is a double jet carbureter. It is said the carbureter never needs adjusting and that the mileage per gallon varies little whether the car is driven 25 or 35 m.p.h. or more.



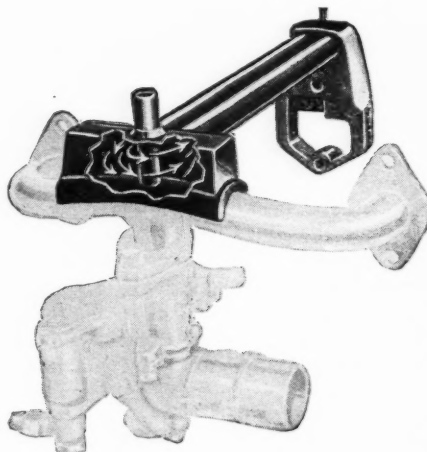
Model "C" Haling Carbureter.

"Adpasco" De Luxe Polishing Cotton

ADPASCO De Luxe Mercerized Polishing Cotton is a new product to be used anywhere on automobiles, for absorbing oil, grease, etc. and for polishing any bright part of the vehicle. The manufacturers say the cotton is free from lint, dust and like objects found in waste and will not scratch the finest surface. The Advance Packing and Supply Co., 808 Washington boul., Chicago, is the producer.

Stop Light Switch

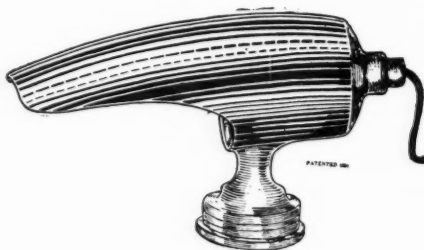
WITTEK Manufacturing Company, 2532 S. Kedzie ave., Chicago, offers a Stop Light Switch which is easy to install and which is said by the producers to give unfailing service. It is for Fords and fastens on the transmission cover. Packed in display boxes of 12. List price, each, 40 cents.



Hot Spot for Chevrolet.

Red Arrow Foot Accelerator

THE Arrow Manufacturing Co., Kokomo, Ind., announces that its product, the Red Arrow Foot Accelerator for Fords is adaptable to the new model Ford cars without change. A specially designed connection, which has always been used on the device, provides the same easy installation as on older models and is not affected by the changes in Ford carburetor controls. This connection consists of a swivel post and adjusting link, which joins the auxiliary rod to the hand throttle arm on the left side of the motor. The auxiliary rod passes through the swivel post, which is free to turn, thus assuring a smooth, even action in foot throttling. The adjusting link provides a wide range of adjustment and prevents all lost motion. The list price of the Red Arrow Foot Accelerator is \$1.50, west of Rockies \$1.75.



Ideal Rode Lite.



Wittek Stoplight Switch for Fords.

Hot Spot for Model K Chevrolet

SUMMER performance in winter weather is promised by the Dunn Manufacturing Co., Clarinda, Iowa, through use of the Dunn Hot Spot for Model K Chevrolet. It is said the Hot Spot will render effective service in averting prolonged choking during the warming up period and eliminating bucking and backfiring. A control damper permits applying any degree of heat desired or shutting off the heat entirely for summer driving. Price each \$4.50.

Dash Gasoline Gage

MODEL G Gasoline Gage, produced by the Grolan Manufacturing Company, Dayton, Ohio, is a new mechanically operated instrument board gage which may be easily installed in the tank opening on most cars which do not carry a device of this kind as original equipment. It is said to give efficient service and in all respects answer the needs of the car owner.



Grolan Dash Gasoline Gage.

Ideal Rode Lite

E. H. FINCH COMPANY, INC., 1476 Broadway, New York, is producing the "Ideal Rode Lite," which the makers claim materially reduces the annoyance and danger of night driving, by giving full illumination of the roadway without blinding the drivers of approaching cars. The list price is \$10, which includes ten feet of armored cable and a switch for mounting on the instrument board.

When properly mounted on the left mud guard, the manufacturers say no portion of the light's reflector will be visible to anyone approaching it and the driver will be given a clear view of roadway from the left hand wheel track to the right hand curb for approximately 100 feet.

EDITORIAL

A Crumb of Comfort

ANNOUNCEMENT from Washington that the new tax rate on motor vehicles would cover cars in stock when the expected downward revision goes into effect in March or April will reflect an influence, no doubt on the winter stocking programs of automobile dealers. On the face of reports dealers who stock ahead of the spring selling season will be given advantage of any reduction in the rates made by congress.

Contrary to apprehensions felt by many dealers the dealer will not be obliged to absorb the difference between the two rates on cars contracted for in his heaviest buying period. The dealer who saw a bugaboo in the tax situation now can breathe easier although under any circumstances it would be to his interest to stock amply anyhow in January and February for the buying demand of months immediately later. Regardless of who must stand the difference between the old and new rates the dealer must have an assured supply of cars for the spring trade.

It is still apparent that a cheaper supply of raw rubber will not be cooked up by Great Britain. Here's to the success of American chefs.

Here Are Your Prospects

BUSINESS institutions in all parts of the country were very liberal this year in provisions for salary bonus distribution among employees. The close of the year records numerous instances of exceptional profit-sharing apportionments in which a host of workers and executives are beneficiaries. We have heard of not a few instances wherein Christmas or year-end bonuses ran into the hundreds of dollars.

This widespread generosity on the part of large employing organizations has a bearing on possibilities in automotive merchandising apart from the indication of prosperous conditions.

It means many income earners will have fattened pocketbooks, holding surplus money to be invested or spent in a wide variety of manners—and it consequently points out for the automotive merchant a potential buying field which he might cultivate profitably within the next few weeks.

One of the first secrets of successful selling is first to locate those who are capable of buying the merchant's products. No doubt there are many persons in this long list of Christmas bonus and profit sharing plan recipients who right now are looking for a place to put the money thus acquired where it will produce the highest possible

degree of satisfaction. So, why not an automobile? It is the business of the dealer and the salesman to give them the idea. It would be a good plan for the dealer to find out what companies in his territory are making special distributions and then go offer the proposition systematically.

And another seasonal selling thought. The end of the year witnesses many changes in positions in business life and many promotions that carry increased salaries. It also is a time when numbers of organizations pay dividends and in instances especially husky dividends. In hunting for new sales leads let's watch closely for the fellow with newly acquired capital. He is looking for a good place to invest or spend. The man without funds will not buy but the man with money is always eligible for consideration in a selling enterprise.

One operation which usually is followed by good health is co-operation.

Going After the "Half Sold"

ACAMPAIGN to increase the sale of winter necessities in automotive equipment is being conducted by the North Carolina Automotive Trade Association. This is a campaign which can serve both to stimulate pre-holiday sales and business after the holidays on through the cold weather season.

In this movement the North Carolina organization is a jump ahead of many of the local trade associations, yet it offers a suggestion to other groups of tradesmen as to one effective means of developing a better market for those items which the car owner should buy and which he is more likely to buy in season than at any other time.

There is no argument as to the relative value of the seasonal drive and there is no argument against efforts to "sell" the public on something generally accepted as logical.

Repeated reminders are necessary to convert the "half sold" prospect into a "fully sold" prospect, to convert "believers" into actual buyers. There is a difference between admitting a fact and buying on the strength of your convictions.

Car owners know there are winter necessities they should have and they are ripe to buy if the thought is kept constantly before them.

The trade needs more of these local cooperative movements.

"Championship Stuff" has been the 1925 slogan. Let "Championship Stuff" be an actuality in 1926.

Christmas Boosts Automotive Sales

Stocks on Hand Promise No Trouble for Dealers

Early 1926 Expected to Witness Good Business If General Prosperity Continues

NEW YORK, Dec. 30.—Moderately increased sales of new and used cars and a spurt in the sales of accessories and special equipment marked the holiday season for the automobile industry. It was an unusually successful Christmas period, being helped by the low prices of the popular closed cars and a spirited merchandising campaign by distributors and dealers.

Nearly all the motor car factories are operating on reduced schedules or are closed for inventory and plant changes. During January production will be stepped up gradually. Dealers are entering the New Year with somewhat larger stocks than they held at the corresponding time a year ago, but the supply should give no trouble if sales during the early part of 1926 are on the level confidently expected by the factory executives.

There seems to be no reason to fear an early slump in the automotive market so long as general prosperity continues. The motor cars ought to find buyers. The only adverse factor that is given any serious consideration at this time is the possibility of higher prices as a result of increased cost of tires as original equipment. But the advance, if made at all, will be almost if not quite compensated by the tax reduction contemplated in the new revenue bill.

One company last week announced price cuts and two advanced. The large producers, however, for the most part are keeping their price plans for the early part of the year very much to themselves. There will be considerable maneuvering for position between now and the closing of the New York automobile show, as competitive considerations are playing as large a part in the establishment of price lists as are the economic factors.

A campaign for economy in the use of tires has been launched by the industry with a view, ultimately, of bringing down the cost of crude rubber, but it is realized that this will be a slow process at best.

REGISTRATIONS INCREASE

EVANSVILLE, Ind., Dec. 31.—Passenger car registrations in Vanderburgh county for the official year of 1925 ending December 15, totaled 17,463, according to the report of the local branch of the secretary of state's license bureau. The total marks a gain of 1,500 passenger car registrations over the year of 1924, it was said. Motor truck registrations are at about the same level as in 1924. A total of 2,638 motor truck licenses were issued in 1925.

CLEVELAND REVISES PRICES

Cleveland, O., Dec. 28.—An upward price revision has been announced by the Cleveland Automobile Co., on two models of the "31" chassis and two models on the "43" chassis. The three-passenger coupe on the "31" chassis has been increased \$60, the sedan on the same type has been increased \$90, the coupe and sport touring on the "43" chassis each are increased \$50 under the new price scale.

HAYNES SALE PLANNED

INDIANAPOLIS, Dec. 26.—Arrangements for the liquidation of the balance of the property of the Haynes Automobile of Kokomo were made here by a contract drawn between the Fletcher Savings and Trust Company of this city as trustee for the bondholders of the Haynes plant and the Carle Machinery Company of Detroit which will handle the details of disposition of the assets and machinery of the plant. The remaining assets include the six major buildings of the Haynes plant, 40 houses in Kokomo, a farm of about 40 acres and the machinery and equipment of the plant. The value is estimated at about \$500,000.

CHANDLER-CLEVELAND MERGE

CLEVELAND, O., Dec. 31.—A charter for the merger of the Chandler-Cleveland automobile companies of this city has been filed with the department of state of Delaware. The corporation provided is to have 350,000 shares of preferred stock and 1,000,000 of common stock of no par value. Stockholders of the two companies are to have until January 15 to exchange their common stock for preference stock of the combined companies. An offering of preference stock also will be made by bankers, the proceeds of which will be used to retire the present preference stock of the Cleveland Automobile Co.

Rickenbacker Announces Upward Price Revisions

Detroit, Dec. 28.—Upward price revisions on both six and eight cylinder models and the addition of new coupe-sedan to both lines, are announced by the Rickenbacker Motor Co. The new price schedules follow:

Six		
	Old	New
Phaeton	\$1,495	\$1,750
Brougham	1,595	1,895
Coupe-Roadster	1,695	1,920
Sedan	1,795	2,095
De Luxe Coupe	1,995	1,995
Coupe-Sedan		1,695
Eight		
	Old	New
Phaeton	\$1,995	\$2,150
Brougham	1,995	2,295
Roadster	1,995	2,195
Coupe-Roadster	2,095	2,320
Sedan	2,195	2,495
De Luxe Coupe	2,320	2,395
Coupe-Sedan		2,095

Peoria Association Warns Trade Against Overstocking

Resolution Also Opposes Recourse Financing and "Cramming" By Makers

CHICAGO, Dec. 26.—Resolutions opposing recourse financing and declaring that the manufacturers are again overstocking their dealers were adopted at a recent meeting of the Peoria Automotive Association and broadcast to dealers' associations generally. Among the statements made were:

The experienced and business-like automobile dealers look with growing alarm on the factory policy of insisting on the dealer endorsement in any form on retail time paper.

Any difference in the cost to the purchaser of endorsed paper and non-recourse paper must be paid by the dealer either in money or work. There is no practical difference in the long run between endorsement with recourse and paper with repurchase agreement. The same amount of expense and work is necessary to keep the customer paying. The local banker is becoming wary of loans to heavy endorsers.

The cash buyer helps to pay the cost of time financing where the finance company is subsidized by the manufacturer.

Local, state and national dealers' organizations should immediately recognize that the large producers of motor cars are again resorting to cramming cars on dealers in excess of any reasonable stock. With the production capacity of six million cars for 1926 and a potential market for three and a half million the dealers must promptly recognize the dangers before them.

An automobile carried in stock for three months must always be sold at a loss, as even in the best regulated agencies the net profits do not usually exceed 5 per cent and this is completely absorbed by three months' storage and financing.

N. Y. TRUCK MEN MEET

NEW YORK, Dec. 31.—At the annual meeting of the Motor Truck Association of America, Inc., held at Cafe Boulevard, officers and directors were elected, finances discussed and the association's opposition to the gasoline tax and compulsory automobile insurance reasserted.

Officers elected are: President, Joseph Husson, Eleto Co.; first vice-president, Hermann Irion, Steinway & Co.; second vice-president, Charles M. Geiger, Peter Doelger Co.; third vice-president, Thomas R. Freebody, Louis K. Liggett Co.; secretary, C. M. Billings, Vacuum Oil Co.; treasurer, Nat Mallouf, Mallouf Haulage & Maintenance Co.; directors for three years, Henry K. Jaburg, H. R. Schmadeke, Commonwealth Fuel Co., E. Ward, Franklin Simon Co. and Herman J. Harms.

Increased Interest Being Shown in Trade Days

Distribution of Tickets Begins Immediately After Christmas for Both Displays

NEW YORK, Dec. 26.—All signs point to increasing interest in the trade days at the National Automobile Show in Grand Central Palace Jan. 9-16. Thousands of acceptances have been received to the invitation for makers of cars and accessories, jobbers, garage owners, body builders, fleet users and others connected with the industry to attend the show on Monday and Tuesday from 10 a. m. to 1 p. m.

The S. A. E. is making special plans to have as many of its members as possible attend on the trade days because of their educational value in addition to the opportunity they will offer to make valuable comparisons and to be prepared to do business most expeditiously in their various lines through the year.

That accessory manufacturers realize the value of the trade days is shown by the steadily increasing list of exhibitors both at the New York and Chicago shows.

Tickets for the trade days will be distributed immediately after Christmas. A separate ticket will be required for each session—a pink and blue for the New York and white and red for the Chicago trade days.

More than 400 dealers have already applied to S. A. Miles, show manager, for supplies of the show poster, which uses the figure of the Winged Mercury grasping a wheel in a small cut-out printed in yellow and black. The poster is in the form of a hangar and is being distributed by Metropolitan dealers.

For the first time in the history of the national show in Grand Central Palace two separate entrances will be provided to relieve congestion. The new entrance on Park avenue will be a time saver from all the hotels except the Commodore, for all the West Side and for taxicab users.

ENGINEERS DISCUSS HONING

DETROIT, Dec. 26.—The meeting of the Detroit Section of the Society of Automotive Engineers drew an attendance exceeding 200 automotive men, the great majority of whom were production executives. The subject under discussion was cylinder finishing with particular reference to the question of lapping and honing as compared to the older grinding method.

Production men from Chrysler Motor Corp., Wilson Bros. Foundry and Machine Co., Continental Motors Corp. presented short papers as did representatives of Oakland, Dodge, Lincoln, Jewett, Hupp, White and Buick. In general, the consensus was that honing offers a great saving in production time and a superior finish providing the preliminary operations are of sufficient accuracy. In fact every speaker emphasized the need for careful boring and reaming prior to the honing operations.

Motor Car Output in U. S. and Canada

WASHINGTON, Dec. 31.—Following tables show the production of automobiles, both passenger cars and trucks, for the first 11 months of 1925, compared with the full year, 1924, as announced by the Department of Commerce for the United States and Canada:

Total Cars and Trucks

	1925	1924
Jan.	241,062	324,567
Feb.	287,213	367,370
Mar.	377,252	393,489
Apr.	439,125	384,353
May	426,016	331,638
June	447,860	254,146
July	400,361	260,935
Aug.	359,581	283,879
Sept.	332,781	295,480
Oct.	452,392	293,356
Nov.	376,251	232,248
Total 11 months	3,995,029	3,430,467
Dec.		209,631

The following table shows car and truck production in 1925 in United States and Canada:

	Cars	Trucks
Jan.	212,921	28,141
Feb.	252,803	34,410
Mar.	332,154	45,008
Apr.	391,302	47,823
May	382,714	43,303
June	364,806	38,054
July	358,554	41,817
Aug.	221,831	37,750
Sept.	272,425	60,368
Oct.	406,572	45,823
Nov.	336,358	39,893

FORD SETS NEW RECORD

DETROIT, Dec. 26.—The sale of Ford passenger cars and trucks for November 1925 marked the best November sales record in the history of the Ford organization. Figures released by the company show that 146,788 passenger cars and trucks were sold during the past month, an increase of approximately 25,000 over November 1924. The enrollments under the Ford weekly plan also showed a marked gain over the same period of last year. For the month 31,425 purchasers of Ford products were enrolled under the weekly payment plan. This is twice as many as for November 1924.

Western Electric Supply Department Incorporated

NEW YORK, Dec. 26.—Western Electric Co. has set apart its electrical supply from its telephone manufacturing business and incorporated the former under the name of Graybar Electric Co., a contraction of the firm name of Gray & Barton under which the supply business came into existence in 1869. Physical separation of the two departments was carried out in 1923 with the opening of general supply department offices here and the advent of the Graybar concern involves comparatively few changes. Albert Lincoln Salt is president, Frank A. Ketcham, executive vice-president, Leo M. Dunn, vice-president in charge of merchandising and accounting, George E. Cullinan, vice-president in charge of sales, Elmer J. Shepard, treasurer, and N. R. Frame, secretary.

Tire Production Expected To Set December Record

High Cost of Crude Rubber Cannot Hold Back Output Longer, Officials Believe

AKRON, Dec. 31.—Indications are that automobile tire production this month will surpass that of any previous December. Present schedules of the tire factories are well ahead of the same month last year.

The Akron plants started increasing their production last month, following a slight slump in October. Even then sales were comparatively large, but it was desired, if possible, to conserve the dwindling supply of crude rubber in an effort to bring down the price. The policy of eliminating "spring dating" on tire shipments was designed for this purpose.

High cost of crude rubber is no longer a factor in the industry, as far as production is concerned. The manufacturers are convinced that dollar rubber and possibly higher is here to stay, and they have ceased worrying over the price. It has been demonstrated that the market cannot be depressed by any artificial means.

Moreover the demand for tire and other finished rubber goods for immediate delivery has continued heavy, so that production has been abnormally high in the last quarter of the year.

Practically all the rubber companies are preparing for a banner year in 1926, by building additions and making improvements to their plants. Nearly \$5,000,000 is being spent this year in expansion programs.

N. A. P. A. ELECTS OFFICERS

DETROIT, Dec. 26.—Election of officers and discussion of policies for the coming year marked the convention of the National Automotive Parts Association held here Monday and Tuesday of this week. The board of directors was re-elected.

In addition to formulating policies, members of the association went into a one-day session with manufacturers whose lines they represent. This was for the purpose of discussing prospects for 1926.

Officers elected were: George W. Yeoman, chairman of the board, H. G. Root, president, Automotive Parts Corp. of Ohio, W. W. Martin, vice-president, Superior Motor Parts Company of Pittsburgh, L. B. Fijux, secretary and treasurer, Automotive Parts Corp. of Michigan.

In addition to the above officers, the following men compose the board of directors: A. F. Baxter, Standard Motor Parts Company, Buffalo, R. W. Boozer, Central Motor Parts Company, Indianapolis, Estel Scott, General Auto Parts, Kansas City, Mo., C. C. Colyer, Motor Sales, Los Angeles.

Dodge Brothers Sales Ahead Of 1924 by December 15

**Price Reduction to Be Announced
Soon Expected to Range from
\$50 to \$200**

NEW YORK, Dec. 31.—Although no official statement can be obtained it is reported that the Dodge Brothers price reductions to be announced Jan. 7 as retroactive to Dec. 15 will range from \$50 to \$200. Robert C. Graham, newly appointed vice-president and sales manager of Dodge Bros. Inc., reports that the announcement has brought telegrams from dealers everywhere.

Dodge Brothers shipments for the first eleven months of 1925 were 242,614 against 211,669 in the same period last year, an increase of 14.6 per cent. Sales to Dec. 15 this year have exceeded the entire year 1924 by 16,973, establishing a new high record for the company.

Increased production this year is accounted for by export, bus, truck and commercial car as well as passenger car business. According to an official report, 1,466,023 cars had been produced previous to Dec. 1 and since the completion of the first Dodge Brothers car eleven years ago it is said that 90 per cent are still in service.

Financed wholly out of surplus earnings Dodge Brothers will have completed early in 1926, plant additions costing about \$8,000,000 increasing output capacity by about 50 per cent to meet the greater demand at home and abroad. Over 20 per cent of production is said to consist in commercial cars, trucks, buses and chassis, and the recent acquisition of a majority interest in Graham Bros. fortifies the position in the commercial car field.

Last of N.A.D.A. Congresses Is Held in Indianapolis

INDIANAPOLIS, Dec. 26.—The ninety-seventh and last of the sales conferences of the National Automobile Dealers' Association flying squadron was held in Indianapolis with more than 600 dealers and salesmen and other of the automobile trade in attendance. It was the largest automobile sales meeting ever held in Indianapolis and its success was due largely to the promotion of the Indianapolis Automobile Trade Association officers and John B. Orman, manager, who was responsible for getting out the crowd that came here from all parts of the state.

The meeting was conducted by Lynn M. Shaw, assistant general manager for the N. A. D. A. who was introduced by Vice-President J. S. McFarland, president of the Indianapolis trade body and president of the Lathrop-McFarland Co., distributor of Oldsmobile. Both H. D. Bullock, market analyst of the N. A. D. A., and H. K. Kroh made strong talks after Shaw's address.

Stretch Rubber for Economy

(Continued from page 10)

America will attack the monopoly from the production and manufacturing end, thus creating a 100 per cent front of manufacturers and users, against the monopoly. Representatives of the industry, who attended the conference in Secretary Hoover's office, included: Alfred Reeves, manager of the National Automobile Chamber of Commerce; H. H. Rice, and Pyke Johnson, of the same organization; W. O. Rutherford, president of the Rubber Association of America; Paul L. Palmerton, chief of the Rubber Division, U. S. Department of Commerce; Harvey S. Firestone, president of the Firestone Tire & Rubber Company; Ernest Smith, general manager of the American Automobile Association, and the heads of several other tire manufacturing companies.

Simultaneously with the industry's attack on the rubber monopoly a resolution was introduced in Congress providing for a sweeping investigation of the British monopoly on crude rubber, which has resulted in rubber speculation and an increase of from 35 to \$1.10 per pound.

As a result of the increase automobile users are paying from \$30 to \$70 a year more than is necessary, for their tires, it was charged on the floor of the House by Congressman Tilson, House floor leader, and author of the investigation resolution.

The N. A. C. C. has already inaugurated a campaign for the conservation of rubber through the more careful use of tires in service.

The Chamber points out that while every automobile manufacturer is endeavoring to lower costs in order to supply his product at the lowest possible price, the whole automotive industry is threatened with increased costs unless there is a decreased demand for crude rubber to offset the high prices created by the British Stevenson restriction plan, despite the fact that there is no real shortage of crude.

The conservation campaign is a direct result of Secretary Hoover's warning that "we are now subject to the full result of monopoly action." Among his five recommendations for ultimate relief against the "trade war being made upon us" he included a strong systematic campaign for conservation.

Following a conference between Alfred Reeves, general manager of the N. A. C. C., and Secretary Hoover and by instruction from the recent meeting of the Chamber directors, President Clifton appointed a committee consisting of Alvan Macauley, Packard, chairman; H. M. Jewett, Paige, and H. H. Rice, General Motors. This committee now recommends:

That the Chamber enlist the support of the 2,000,000 automobile dealers, salesmen, garagemen, professional chauffeurs and repair parts men as well as owners of the 18,000,000 motor vehicles in the

United States in a campaign for better use of tires by taking the following steps:

1. Ask the cooperation of all organized units of the automotive industry and users.

2. Ask car users to obtain the greatest possible mileage from their tires by maintaining proper air pressure; by making repairs promptly; by using brakes carefully; and by rounding corners at slow speed. If the 18,000,000 motor vehicles in the country were so used it is estimated that at least 25 per cent would be added to tire mileage.

3. Ask manufacturers to include in their advertising some statement calling attention to the need for better use of tires, such as those contained in a sheet attached to the announcement. Some of the largest manufacturers have already agreed to this.

"The British restriction plan," says the Chamber, "arbitrarily limits the amount of crude rubber that can be shipped by planters out of the British East Indies. While it is now ruled that 100 per cent of 'standard production' may be shipped after Feb. 1, this is based on 'standard production in 1920,' and is not at all the rubber which could be available without restriction.

"The United States uses 70 per cent of the world's crude rubber. If a fair price is 36 cents per pound the present prices, hovering around \$1, will, according to Secretary Hoover, cost the American public \$660,000,000 this year or an excess charge over a fair price of from \$20 to \$30 per set for each light automobile and from \$50 to \$60 per set for each heavy car."

The latest British estimate says that British rubber companies have increased their profits this year by about \$250,000,000 and that the bulk represented America's purchases, estimated to have exceeded \$500,000,000 in the last twelve months.

Chrysler Has New Six

(Continued from page 23)

structure and belt moulding are in black with a silver gray finish employed below the bead.

Heaters are fitted in all closed models while the aluminum binding together with felt around the pedals and controls keeps out draughts. Standard equipment includes: double automatic windshield cleaner, twin mirrors attached to one piece Fisher windshield, 90 mile speedometer, radiometer, electric cigar lighter, clock. Instruments are arranged in three groups on the walnut finish instrument panel. The indirect lighting system is used.

McDUFFEE IS ADVANCED

INDIANAPOLIS, Dec. 26.—Joseph H. McDuffee has been advanced to the position of general sales manager of the Prest-O-Lite Co., it was announced here this week by Robert J. Hoffman, vice-president of the company. McDuffee is well known to the industry as a former official of the Cole and of the Elgin.

Parts and Accessory Trade Closes Its Greatest Year

**First Quarter of 1926 Expected 25
Per Cent Ahead of Last Three
Months of 1925**

NEW YORK, Dec. 31.—The automotive parts and accessory business is closing the biggest year in its history and will enter 1926 with excellent prospects, according to the Motor and Accessory Manufacturers' Association.

A large group of representative members, analyzing sales expectations for the first quarter of next year, anticipated a volume in that period exceeding the current quarter by approximately 25 per cent and the first quarter of 1925 by upwards of 30 per cent.

These companies reported shipments for the month of November at 140 per cent of the January level as compared with 188 per cent for October and 158 per cent for September. November business exceeded February and March as well as January but fell behind all other months of the year up to date.

Manufacturers in all divisions of the industry reported anticipated gains in business in the coming quarter over the first and current quarters of 1925. Anticipated gradual increase in car and truck production as the new year gets under way, the original equipment makers looked for a steady but not steep increase in business in the early part of 1926. Makers of products sold to the trade looked for larger increases in view of the tremendous gain this year in car and truck registrations.

Jobbers throughout the United States and Canada reported November business generally less than October but materially ahead of November a year ago. Increased use of closed cars has materially improved automotive jobbers' business for the late fall months.

MILWAUKEE TRADES MEET

MILWAUKEE, Wis., Dec. 26.—An attendance estimated at 500 greeted the appearance of nationally known figures in the automobile industry at the sales conference held at the Pfister hotel here Dec. 16, sponsored by the Milwaukee Automotive Dealers' Association. The conference featured a discussion on the building and developing of sales plans, and training of salesmen on a scientific basis, led by noted authorities on the subjects.

NEW LOCOMOBILE DEALERS

BRIDGEPORT, CONN., Dec. 26.—Locomobile Company of America, Inc., announces the appointment of the following as direct dealers to handle the Junior Eight:

Byrne Locomobile Company of Lake Wales, Lake Wales, Fla., H. W. F. Motor Sales Co., Peoria, Ill., Ralph N. Baker, Springfield, Ill., Locomobile Company of Norwalk, Norwalk, Conn., Locomobile Co. of Fresno, Fresno, Cal., B. E. Northland, Santa Ana, Cal., H. C. Field, Brawley, Cal.

Horses Are Scarce In Oakland

OAKLAND, CAL., Dec. 26.—Horses are so scarce in California that no one will furnish a team of them to this city of 250,000 inhabitants. Bids on two 1,600-pound draft horses were asked by the street department three weeks ago. The department wanted the horses to haul plows and scrapers. Not a single bid was received. The municipal purchasing agent was then authorized to buy the horses in the open market, but when he went to the said o.m., there was not a draft horse to be had. Mayor John L. Davie has now instructed the purchasing agent to organize an expedition into the San Ramon and Livermore valleys, and further, even back into the high Sierras, if necessary, where horses are said still to be in existence.

ZONE SALESMEN MEET

ATLANTA, Dec. 26.—Chevrolet salesmen in the ten zones which comprise the southeastern division met recently for their annual conference in Atlanta, and each one of the ten zone representatives was awarded a special bonus of \$100 for exceeding his 1925 sales quota. The increases over last year's volume ranged from 28 per cent to as high as 236 per cent, every zone showing a substantial gain. L. C. Costley, sales manager for the Atlanta branch, presided at the meeting.

FLINT PROMOTES KAUFFELT

DALLAS, Tex., Dec. 26.—L. M. Kauffelt, district manager for the Flint Motor Company with headquarters at Dallas, has been made regional manager for the company with headquarters at Kansas City. His new territory will cover Iowa, Nebraska, Illinois, Kansas, Missouri, Oklahoma, Texas and New Mexico. R. Roscoe Shumate, assistant sales manager of the Dallas branch has been named manager of the Dallas branch.

Willys Export Corp. Will Take Foreign Federal Sales

TOLEDO, Dec. 26.—Announcement was made here today that the John N. Willys Export Corporation would take over export sales for Federal trucks. The agreement goes into effect January 1.

Under the new arrangements, The John N. Willys Export Corporation will handle all sales of Federal trucks in the export territories. The agreement means that the export division of the Federal Motor Truck Company will be eliminated.

Ward Mohun, export manager for the Federal company, will joint the export corporation forces, it also was announced. He will assume his duties January 1 and will in all probability be given the position of manager of truck sales.

Stearns Will Keep Identity After Merger with Willys

**Overland Head Says Car Will Still
Be Marketed Under Same Name
and Built as at Present**

CLEVELAND, O., Dec. 26.—The F. B. Stearns Co., pioneer automobile manufacturer of this city will not lose its identity by the purchase of the plant by the Willys-Overland Co., of Toledo.

John N. Willys, of Toledo, president of the purchasing company so informed Cleveland men interested in the future of the local plant. While en route to Cleveland after the purchase was announced here, Mr. Willys stated that the Stearns car would be operated entirely independent of the Willys-Overland plant.

The Stearns plant will be operated here on even a greater scale than in the past, under plans formulated for pushing the sale of the cars.

George W. Brooker, president of the Stearns Co., said that the manufacture of Stearns-Knight cars would be continued and efforts made to increase sales.

For the last 10 years Willys has controlled the manufacture of Knight engines. The Knight type engine has been a part of the Stearns business for many years. Acquisition of the Stearns plant means that there will be only two makes of passenger cars equipped with Knight engines that are manufactured in the United States.

GOTTFREDSON HAS SALESROOM

CLEVELAND, Dec. 26.—Generally excellent increases in sales recently have made necessary the leasing of a new large down-town salesroom by the Gottfredson corporation, truck division, according to announcement here today by A. B. Miller, sales manager.

NEW GARDNER DEALERS

ST. LOUIS, Dec. 26.—New dealers added by the Gardner Motor Co., include the following:

James J. Sullivan, Jr., Los Angeles, Brawley Motors Co., Brawley, Cal., Diversey-Kimball Garage, Chicago, East Side Motor Sales, Chicago, Gudmundson & Schumm Motor Sales, Chicago, Johnstown-Chandler Co., Johnstown, Pa., M. E. Rose, Eureka, Cal., The Stone Motors Co., Inc., Schenectady, N. Y., J. P. Mosier, St. Francois, Mo., Austin Park Garage & Motor Sales, Chicago, West Side Auto Repairs, Philadelphia, Gardner-New York Corp., New York City, Schlensker Auto Co., Evansville, Ind.

CHRYSLER DEALERS MEET

CINCINNATI, O., Dec. 26.—Formal opening of the new home of the Chrysler car at the Gilbert Avenue and Court Street plant of the Robert Sloan Company took place recently and a get-together session of Chrysler dealers in the Cincinnati territory was held by Mr. Sloan in the afternoon and in the evening a dinner was given at the Business Men's Club. Among the guests at the dinner was J. W. Fields, vice-president and sales manager of the Chrysler Motor Corporation, Detroit.

Louisiana Reports Heavy Sales in Last 3 Months

Winter Expected to Be a Record Breaker and That Business Will Continue Good

NEW ORLEANS, Dec. 26.—Louisiana is well up among the states reporting heavy automobile sales during the past three months. Indications are that the high wave of business will continue into the spring months, usually the best in the year from the dealers' point of view. The pleasing volume of business is attributed by dealers in New Orleans to the fact that conditions throughout Louisiana and Mississippi are sound, to the absence of unemployment and to the plentiful supply of money in the hands of prospective buyers.

New Orleans dealers feel confident that this winter will be a record-breaker in sales and that business will continue at its high crest into the spring months. In anticipation of this increased business, several distributors have already arranged for larger stocks of cars than ever carried in New Orleans before.

This year, more than ever before, dealers assert, the automobile played a bigger part in "Christmas giving." Many dealers arranged attractive terms and advertised their cars as suitable Christmas gifts.

During the year, the closed car continued to win in favor throughout this section of the South. Another favorable indication is that many families are provided with at least two cars. "I have been traveling around the city," one New Orleans dealer said, "and I find that two-car garages are as common as one-car garages were two or three years ago. And whereas the one-car garage was an added feature then, it is emphatically standard now. Just ask the real estate man what chance there is for him to sell a home which is not equipped to house an automobile, or, in the better districts, two automobiles."

OVERLAND DEALERS MEET

SAN ANTONIO, Tex., Dec. 26.—Willys-Knight and Overland dealers from the southwest and most parts of central Texas attended a sales congress at the Gunter Hotel this week. J. P. LeNoir, sales manager for the San Antonio Overland Company, distributor for Willys-Knight and Overlands in this district, was in charge of the conference. E. E. Young of Austin, president of the Austin Automotive Trades Association and Willys-Knight and Overland dealer at Austin, was the chief speaker for the occasion. Some 50 dealers were at the conference.

STREET NAMED BENDIX

SOUTH BEND, Ind., Dec. 26.—The City council of South Bend recently passed a resolution changing the name of North Anthony Street to Bendix Drive, as an

appreciation for the increased industrial activity brought to the city by the Bendix Brake Company. The plant is now turning out 2,000 sets of brakes a day, according to the officials, and this production will be stepped up as rapidly as the various new plant units are completed.

CHEVROLET DEALERS MEET

SAN ANTONIO, Tex., Dec. 26.—Some 50 Chevrolet salesmen of the San Antonio territory attended a sales conference here this week at which J. E. Grimm, advertising manager, and R. K. White, sales promotion manager of the Chevrolet Motor Company, were the chief speakers. Mr. Grimm said the company would spend \$6,500,000 for advertising in 1926 and declared the salesmen could cash in on the company advertising by going after business. The company men will hold conferences in all the large cities of Texas before returning north.

NEW HUDSON DEALERS

WASHINGTON, Dec. 26.—Two new Hudson and Essex dealers have been announced here: The I. C. Barber Motor Company, Fourteenth and Irving Streets, Northwest, and the Moses Motor Company, with show rooms at Connecticut Avenue and R Streets.

Moto Meter Co. Holds Its Eighth Annual Convention

NEW YORK, Dec. 26.—The eighth annual sales convention of the Moto Meter Company, Inc., which was held at the factory offices, Long Island City, was attended by the five district managers, the entire road organization and upwards of 100 from the factory. Sales policies for 1926, advertising schedules and general policies constituted most of the program.

The company has just completed the biggest year in its history, manufacturing approximately 2,000,000 Moto Meters. The plan for 1926 is to go 1,000,000 in sales beyond 1925.

The improved Moto Meter line for next year carries refinements in two models—the de luxe and standard models. Both of these models have gold-finished dials, with script letters. There is also a new retaining ring with the laurel design. Prices remain the same as last year.

DEALER FETES EMPLOYEES

EVANSVILLE, Ind., Dec. 26.—All departments of the Wabash Valley Motor Company, Eighth and Walnut Streets, Hudson and Essex distributor and dealer, were represented at the regular monthly employees' "get together" meeting Friday night, in the company's salesroom. Talks on automotive sales and service problems were made by Carl Maxwell, president; and C. S. McKamy, secretary-treasurer. Sixty employees were present. The Christmas season was observed with a social hour of music and refreshments.

Dow-Jones Announces Terms Of Fageol-Hall-Brill Merger

American Car & Foundry Co. Will Have Control of New Firm When Deal Is Completed

SAN FRANCISCO, Dec. 26.—Negotiations between the American Car and Foundry Company, J. G. Brill & Co., and the Fageol Companies of California and Ohio, have progressed so far in the voting by the stockholders of the Fageol Company of California on the proposed merger, that announcement is made through the Dow-Jones Company that the combination will be consummated. This statement, however, adds:

"Official announcement of the consummation of the plan is looked for within a few weeks."

This is taken by automotive interests here as indicating that the voting by the Fageol stockholders has been slow, and probably is not yet completed, though it is generally believed that the two-thirds majority necessary for the consummation of the merger will be obtained. The Dow-Jones statement continues:

"New J. G. Brill Company stocks—'when issued'—are being quoted in the street at 55 for class 'A' and 30 for class 'B.' This would be equivalent to 140 for J. G. Brill present common, and 110 for present preferred on the basis of proposed terms, which, while no public announcement has been made, are understood to be two shares of class 'A' and one share of class 'B' in the new corporation (i. e., the merger) for one share of the present Brill common; and two shares of class 'A' in the new corporation for one share of the present preferred. In outline, the plan, it is understood, will provide as follows:

"Class 'A' would be eventually retired, giving American Car and Foundry control in class 'B.' Class 'A' stock is to stand at \$50 par, being non-voting, and callable at \$60. Class 'B' common is to be of no par value. Class 'A' stock is to be underwritten at \$55, and dividends of \$4 a year on 'A' and \$2 on 'B' are in prospect.

"The two Fageol Motors—California and Ohio—and the Hall-Scott Motors of New York and California, having been acquired, the merger will be complete with the acquisition of Brill, with the American Car and Foundry holding the controlling interest in Brill."

TIME PAYMENTS ON REPAIRS

CLEVELAND, Dec. 26.—Stimulation of general reconditioning of owners' cars and of garage repair business generally is expected as a result of the introduction by the Superior Boulevard Garage company, Cleveland, of the time payment plan on repair work. The payment plan is similar to that in use in sales of cars on a deferred payment plan. Automotive interests look for the general adoption of the plan here.

Top Cadillac Production Is Assured Throughout Winter

Company Enters December With 3,000 Surplus Orders — Sells 15,000 in Five Months

DETROIT, Dec. 31.—August, September, October and November shipments by the Cadillac Motor Car company were double those of the corresponding months of 1924, according to a statement just issued. At the end of November, Cadillac records revealed 3,000 unfilled orders, which is an unusual situation for this time of the year. This, with the current rate of incoming orders, assures capacity output throughout the winter.

In these figures, Cadillac records one of the most remarkable gains of any of the motor companies. In no twelve-month period have so many producers of high-grade cars placed on the market more popular models at reduced prices.

Popularity of this new line is shown in the statement that in the last five months of 1925 the company sold 15,000 cars—only 2,100 less than during the entire fiscal year from August, 1924, to August, 1925.

October shipments were 3,200. November shows a similar figure, and December shipments will total 3,000. So great is the current demand that the usual December shutdown for inventory will be postponed.

While Cadillac unit production figures are not impressive as compared with volume production such as that of Ford and Chevrolet, they become decidedly so when converted into dollars. The 100 per cent increase in output means a tremendous increase in the amount invested in new Cadillac cars by the buying public. While officials of the company are unwilling to state a dollar volume of Cadillac sales, it is understood that \$100,000,000 is a conservative figure.

PHILADELPHIA PLANS SHOW

PHILADELPHIA, Dec. 26.—There will be at least 39 exhibitors displaying from 45 to 50 different makes of cars at the twenty-fifth annual automobile show of the Philadelphia Automobile Trade Association, to be held in the Commercial Museum, January 16-23. An important innovation will be a model shop and garage, fully equipped, to be conducted and managed by the accessory exhibitors, who will take the entire space for this feature that was used last year for all the accessory exhibits, in the room in the rear of the car display. Provision has been made for 62 accessory displays, in addition.

DUGGAN SUCCEEDS KERBY

TORONTO, Dec. 26.—P. J. Duggan has succeeded R. D. Kerby as sales manager of Durant Motors of Canada, Ltd., Leaside, Ont. Mr. Kerby was recently appointed assistant general manager.

Cleveland to Use No More Horses

CLEVELAND, Dec. 26.—Motor trucks have now replaced the last horse-drawn vehicles in the service of the city of Cleveland, according to announcement here by Howell L. Wright, city utilities director.

Two teams of work horses which for years hauled "trouble" wagons of the light and water divisions of Wright's department have been granted a permanent vacation at the city farm.

Two new White trucks have been thrown into service to replace the horse-drawn vehicles, making a total of 206 Whites in the city's truck fleet.

Dealer Gives Premiums in Sale of New Motor Cars

DALLAS, Tex., Dec. 26.—The Dallas Rickenbacker Company is offering some special inducements to move new cars during the next few days. The Dallas dealers declare the people have never got over the desire to get something for nothing since the days when "a pair of socks was given with each pair of shoes bought, or a pair of suspenders with each pair of pants." They say the people like the idea of having "something thrown in" when any purchase is made.

Hence the Dallas Rickenbacker company has been offering \$42 worth of extra equipment, 50 gallons of gasoline, a gallon of oil, a saving of \$100 on the price of the car, free inspection for one year, service guarantee of 90 days and free driving lessons to any member of the family.

The result of these "free things" was as desired. They caused the prospective buyers to make a decision. Several new Rickenbackers were moved out and others are to be delivered in the near future on the same basis. There was no hike in the regular price of Rickenbacker to make room for the "trimmings thrown in." It was just like the old buggy dealer giving a whip, a can of axle grease and a laprobe free with each buggy sold.

BIFLEX ENLARGES PLANT

WAUKEGAN, Ill., Dec. 26.—The Biflex Products Company, maker of Biflex cushion bumpers, is adding another unit to its plant. The new building will provide 15,000 additional square feet. It will be a one-story structure and modern throughout. A new switch track accommodating four freight cars at one time will run parallel to the building. This additional factory space is made necessary by increased output, and in order to relieve the Halladay plant at Decatur, Ill., of some of the manufacturing burden.

Oakland Closes Second Best Sales Year in Its History

Production and Business in 1925 Approximately 26 Per Cent Over 1924

PONTIAC, Mich., Dec. 31.—In the year soon to close the Oakland Motor Car company will have enjoyed the second greatest sales year in its history, being exceeded only by the boom year following the late war.

The production and sales this year are approximately 26 per cent greater than during 1924. Sales of the new Oakland Six have broken monthly records since the car was introduced toward the last of July. During the last five months of the year, more than 60 per cent of the total year's production and sales were made.

In Detroit, Chicago, Cleveland, Pittsburgh and other cities throughout the country, the Oakland Six enjoyed the greatest fall business in its history. During the month of October, all previous monthly records for production and sales were shattered.

Production schedules had to be revised a month after the new Oakland Six was announced and daily output was increased very rapidly until 375 cars a day were being turned out late in the fall, which was the maximum capacity.

When production capacity had been reached, \$750,000 was spent for more equipment to permit a daily production of 500 Oakland Six cars, which schedule will be reached early in the spring. This is in addition to capacity required for the new General Motors Six, which will be produced and distributed as a companion car to the Oakland.

DURANT DEALERS MEET

OAKLAND, Cal., Dec. 26.—Statement that 1925 had been the greatest merchandising year for the Durant products, and announcement that the most aggressive merchandising campaign ever carried on in the West would be started January 1, 1926, featured the annual convention of Durant and Star dealers in Oakland, late in December. Direct dealers from Idaho, Oregon, Nevada, Arizona, Washington, the Hawaiian Islands and all parts of California were in attendance to the number of 600. Norman DeVaux, vice-president and general manager, presided at the meetings, assisted by H. W. Curtis, director of sales, and Ernest Jones, assistant to Curtis.

THOMPSON BOOSTS VINTON

CLEVELAND, O., Dec. 26.—Thompson Products, Inc., valve and bolt manufacturers, Cleveland, announce the promotion of Al Vinton to district manager of the Pacific coast territory, with headquarters in San Francisco. Vinton was formerly a Thompson sales representative in the Kansas City territory.

Cincinnati Show Space Is Allotted to Car Dealers

Purple, With Splashes of Gold and Green to Be Decorative Motif at Display

CINCINNATI, Dec. 26.—Effects of gorgeous splendor accompanying a Maxfield Parrish motif in purple with splashes of gold and green will be the setting for the decorations of the 1926 Automobile Show of the Cincinnati Automobile Dealers' Association Jan. 16 to 23, as described to the members of the C. A. D. A. by Manager Harry T. Gardner.

The occasion of the description of the 1926 show was the annual allotment of space to the prospective exhibitors which took place at the Grand Hotel. This in itself was novel and interesting and was arranged with a dramatic presentation which impressed the observer with the care of the manager to make the drawing of booth space absolutely fair and impartial.

The following are the exhibitors, their space allotment and their choice number:

Herold Motor Car Co., Reo, 1,740 feet, Choice 17; Citizens Motor Car Co., Packard, 1,640 feet, Choice 21; Max R. Miller Co., Knight-Overland, 1,263 feet, Choice 23; Fulton-Kruse Motors Co., Wills St. Claire, 1,210 feet, Choice 13; Universal Car Co., Ford, 1,140 feet, Choice 5; Hodde Motor Co., Star-Durant, 1,280 feet, Choice 3; Southern Ohio Motors Co., Pierce-Arrow, 1,264 feet, Choice 15; Gilbert-Chevrolet Sales Co., Chevrolet, 1,362 feet, Choice 24.

Leyman-Buick Co., Buick, 1,980 feet, Choice 25; Nash Cincinnati Motors Co., 2,301 feet, Nash and Ajax, Choice 12; Fuller Automobile Co., Hupmobile, 1,800 feet, Choice 20; H. & T. Auto Co., Paige-Jewett, 1,700 feet, Choice 18; Hodge-Long Motor Co., Chandler Cleveland, 1,740 feet, Choice 16; Herschede Motor Car Co., Peerless, 960 feet, Choice 11; Charles Schiear Motor Co., Hudson-Essex, 1,760 feet, Choice 2; Cincinnati Automobile Co., Stutz, 640 feet, Choice 7; Cincinnati Oakland, Oakland-Pontiac, 1,760 feet, Choice 4; J. A. Gross Motor Car Co., Moon Diana, 960 feet, Choice 6. The Moon-Diana space was the same as the company had last year being the block at the entrance of the South wing of Music hall to the right of the entrance. Robert Sloan Co., Maxwell-Chrysler, 1,980 feet, Choice 22; Bishop Motor Car Co., Jordan, 960 feet, Choice 14; Bauer Auto Sales Co., Lincoln, 1,760 feet, Choice 9; Pfaff Motor Car Co., Marmon, 1,440 feet, Choice 1; E. S. Gahagan Company, Studebaker-Rolls Royce, 1,932 feet, Choice 19; Mason Towle Co., Dodge, 1,330 feet, Choice 8; Franklin Motor Car Cincinnati Co., 1,210 feet, Franklin-Locomobile, Choice 10.

After the member organization had been allotted, space allotments of 506 feet were made to Velie; 924 feet to Flint and 550 to Cincinnati Cadillac Co. A few small spaces were reserved for exhibitors of accessories. Two other applicants for space were not able to obtain allotments because their papers did not arrive in time to be considered.

NEW PAIGE DEALERS

DETROIT, Dec. 26.—The Paige-Detroit Motor Car Company has appointed the following new dealers:

Troost Paige-Jewett Co., Kansas City, Mo.; Jaige-Jewett Co., Newark, N. J.; Watkins Motor Co., Chaffee, Mo.; William

V. Bird, Coeur D Alene, Ida.; F. H. Van Dorn, Red Bank, N. J.; Paige-Jewett Corp., Appalachia, Va.; Auto Service Garage, Dry Ridge, Ky., Gravois Paige-Jewett Co., St. Louis, Mo.; Linton Motor Co., Lowell, Ariz.; J. D. Rake, Richwood, W. Va.; Mulligan Paige-Jewett Co., Savannah, Ga.; Decatur Paige-Jewett Sales, Decatur, Ind.; W. A. Grate, Ashley, Ind. The Lostro Auto Sales, Columbus, O.

N. T. D. A. TO MEET AT SHOW

NEW YORK, Dec. 26.—George J. Burger, secretary-treasurer of the National Tire Dealers' Association, announces that the board of directors will hold its next meeting in Chicago Feb. 1 and 2, during the Chicago show. The Greater New York Tire Dealers' Association of which Burger is president will hold its annual dinner-dance Jan. 14 at Hotel Pennsylvania, during the New York show. The Chicago Tire Dealers' Association will probably hold its annual dinner-dance during the Chicago show but the date has not been selected.

D. B. EXPORT MEN LEAVE

DETROIT, Dec. 31.—In line with the program of expansion in the export field, nine men have been sent by the export division of Dodge Brothers, Inc., to various parts of the world to supplement men in the various territories. Three have been sent to Asia, three to Europe, two to South America and one to South Africa. These men will open up territory which has not been developed and will specialize in helping dealers in the territories to which they are assigned. Among the new branches which will be opened by the export division are the following: Johannesburg, Singapore, Tsien-Tsien, Hamburg, Buenos Aires. Another branch for Southern Europe will be opened in the near future.

Ford Engineers Show Plans Of New Airship to Coolidge

WASHINGTON, Dec. 26.—Agents of Henry Ford here have presented to President Coolidge at the White House secret plans for construction of a giant, all-metal dirigible, to be as large as the Los Angeles and to be safer from destruction than any bird machine ever devised.

The plans were described by W. B. Mayo, Ford aeronautic engineer, who was accompanied by Howard Coffin, head of the Government's airship production during the war, and since a member of the Morrow Aircraft Commission. Mr. Mayo informed the President that every primary section has been subjected to every known test following its construction and has withstood them all in a most remarkable manner.

The new machine is to be of aluminum, it is understood, but unusual secrecy has attended the development of the new air monster and Mayo brought no written plans. Special scientific tests are said to have developed machinery which defies all corrosive acids that in past machines have eaten away substantial parts and subjected the birdmen to grave danger. The metal dirigible will be able to use either hydrogen or helium.

Mexican Demand for U. S. Cars Shows Heavy Advance

Estimates Show Volume Has Doubled in 1925 over 1924—Prices Average High

LAREDO, Tex., Dec. 26.—That American made automobiles are finding favor in Mexico and the trade with the United States is increasing at a rapid rate is indicated by reports made by Brennan & Corrigan, custom brokers here.

According to their report a total of 772 car loads of automobiles passed through Laredo for Mexican points in 1924 while already more than 1,200 car loads have been exported through Laredo so far this year and another 1,000 loads are scheduled to move before the 15th of January. In 1924 a total of 5,000 American made automobiles passed through here for Mexican points. This year the total number will reach 10,000 it is said. The majority of the automobiles routed through here went to Monterey, San Louis Potisi, Victoria, Saltillo and Mexico City. In price they averaged more than \$1,000 each.

Automobiles passing through here for Mexican points are paid for by purchasers before they are delivered on Mexican soil unless the purchaser happens to be a representative of some factory with a financial rating that is gilt-edged. A good number of the cars passing through here this year originated at San Antonio and Dallas and were results of sales efforts on the part of automobile concerns in those cities.

The value of automobile tires, accessories and parts passing through here for Mexican points during the year approximate \$750,000,000 it is said. This is three times the amount passing through here last year. A considerable amount of these items originated at San Antonio and Dallas where Mexican dealers and Mexican car owners are inclined to shop for prompt shipment.

Reports brought to the border are that four of every five cars of recent vintage seen in Mexico are American made.

CHEVROLET DEALERS BANQUET

NEW ORLEANS, Dec. 26.—One hundred and sixty-five agents and dealers of the New Orleans district were guests of the Chevrolet Motor Company at a banquet in the convention hall of the St. Charles Hotel Saturday night, November 27 in celebration of their record as a leading sales organization. W. F. Doyle, sales manager of the district, which comprises all of Louisiana, half of Mississippi and part of Alabama, was toastmaster. The list of speakers included: E. W. Fuhr, regional sales manager of St. Louis; C. E. Dawson, assistant general sales manager, Detroit; R. K. White, service and promotion manager, Detroit; J. E. Grim, advertising manager, Detroit and L. F. Garlock, assistant service and promotion manager, Detroit.

Nash December Business Seen 50 Per Cent Ahead of 1924

**Orders by Middle of Month Are
More Than All of Same
Period Last Year**

KENOSHA, Wis., Dec. 31.—December Nash business is running at a rate better than 50 per cent over December 1924, which was the greatest December in Nash history, according to E. H. McCarty, general sales manager of the company. "Despite the general belief," says Mr. McCarty, "that this pre-holiday season is supposed to witness a slackening of sales throughout the country, we are enjoying a brisk demand that gives promise of surpassing last December sales by at least 50 to 60 per cent. At the middle of the month, we had bona fide orders on hand for 50 per cent more Nash cars than during the whole of December a year ago. And December, 1924 was the greatest December in Nash history.

"There are several ways to account for this unusual selling activity. In the first place, Nash sales were considerably stimulated by the Nash announcement of price reductions in November. On top of this our dealers have been concentrating their selling efforts during the last few months toward educating the public to the special winter features of the Nash cars.

"The increasing popularity of the automobile as a gift for Christmas has also played an important part in building up our volume of business this month. The stability of general business conditions and the sound prosperity of the country is largely responsible for this active Christmas buying.

"I understand that the Christmas savings funds in Chicago alone reached a total this year of \$25,000,000 as compared with \$20,000,000 for 1924. And according to some recent figures given out by the American Bankers Association, the savings deposits for the entire country total \$2,000,000,000 more than a year ago. All this is finding reflection in increased motor car buying, and we are feeling the effects by a volume of orders that is far above all records for the corresponding period of previous years."

OHIO DEALERS HEAR N. A. D. A.

COLUMBUS, O., Dec. 26.—More than 260 dealers and salesmen in central Ohio gathered at the Deshler Hotel for afternoon and evening sessions when dealers and salesmen's problems were discussed and explained. The meeting, which is among the first of a series to be held under the auspices of the N. A. D. A., was addressed by Lynn M. Shaw, assistant general manager; H. D. Bullock, sales analyst and A. R. Kroh, sales promotion advisor of the N. A. D. A. A. C. Faeh, manager of the Ohio Council of the N. A. D. A., arranged for the meeting and made a short talk in introducing the speakers.

Booth Joins Ajax Motors



Harold W. Booth, former sales manager of Willys-Overland St. Louis branch, now assistant Ajax sales chief.

TOWN NAMED FORDSON

DETROIT, Dec. 26.—Springwells, a small municipality west of Detroit, has voted to change its name to Fordson, in honor of the Ford family. The vote was 269 for to 237 against. By its new name, Fordson will honor every member of the Ford family, the mother and father of Henry Ford, Mr. Ford and Mrs. Ford and his brothers and son Edsel Ford, and Mrs. Edsel Ford. While members of the Ford family do not object to the city using the name they have so far refused to discuss the change.

RECOURSE IS OPPOSED

CHARLOTTE, N. C., Dec. 26.—Proposals to revise automobile financing contracts to include a recourse clause is becoming a widely discussed subject among automobile dealers and distributors in this territory. The subject was discussed by representatives of the Commercial Investment Company, of New York, and Carolina dealers and distributors of Willys-Knight and Overland lines, at a conference here. The dealers vigorously opposed the proposal.

TRUCK DEALERS MEET

ATLANTA, Dec. 26.—International Truck dealers in the Atlanta territory attending the annual sales conference of the Atlanta branch of the company recently were told that the company's truck sales in this territory during 1925 have been approximately 300 per cent greater than they were in 1924, and that all indications promise that 1926 sales will exceed 1925 by at least 100 per cent.

South African Conditions Show Good 1926 Prospect

**Authority Sees Need, However, of
Better Contract System on Part
of U. S. Car Makers**

NEW YORK, Dec. 31.—William Campbell, manufacturers' representative of Johannesburg, British South Africa, who for 20 years has handled a wide line of American cars and parts for that country, is on his annual visit to the United States and will remain until after the national shows.

He reports general conditions in South Africa as unusually favorable, due to the phenomenal corn and fruit crops. The only cloud on the horizon is the seamen's strike, which interferes with exportation of citrous fruits. The corn crop this year was the largest in the country's history and had an added value due to the veritable chain of grain warehouses which the government has erected throughout the country and the increase in railroad rolling stock.

Nevertheless several of the largest importers of automobiles are in a more or less nervous condition, due to changes made by American manufacturers in their South African representation. Annual contracts, under which these importers have been working, were never so unpopular as now, because of cancellations by cable. This question is being discussed in South Africa more than ever.

Too high prices placed on cars by certain importers, and too little attention to service are also causing disturbance. There are examples of 300 per cent profits on replacement parts, which is not considered good for the trade.

European manufacturers have already sensed the situation and some who have been luke-warm in the South African field are planning for permanent representation and giving five-year contracts. Mr. Campbell believes that American manufacturers should get into direct contact with the foreign field, just as they are in the domestic field.

CHANGES TRADE NAME

MARION, Ind., Dec. 26.—The Indiana Manufacturing and Electric Company, manufacturers of automobile accessories and Indiana Hyperdyne radio receivers, has announced that the trade name of the company's entire line of products will be changed to "Case." This name will be used on all their products regardless of their nature or through what channels they are marketed. The Indiana Manufacturing and Electric Company has been operating in combination with a subsidiary company, the Indiana Radio and Electric Company in the manufacture and marketing of this line of radio receivers. These two companies have been consolidated, the assets of the Indiana Radio and Electric Company have been completely absorbed by the manufacturing company and the business will be conducted and owned entirely by the latter company.



Along Automobile Row



LITTLE ROCK, Ark.—T. S. Farrell, formerly district agent for the Garford Motor Truck Company, has formed the Rickenbacker Farrell Company, which will have the agency for the Rickenbacker automobile agency in all except seven counties of the state. The location of the sales offices has not been determined, Mr. Farrell said.

MONTREAL.—Montreal Tire Sales, 1348 St. Lawrence boulevard, has gone into the radio field and is featuring the Rogers Batteryless A-C radio receiving sets.

DENVER.—Under the name of the Denver Velie Company, G. R. Pennington of the Pennington-Reed Insurance Company has taken over the Velie sales agency for this district, and is located at West Fourteenth and Bannock.

CHICAGO.—Carl M. Schonig, formerly a Hupmobile dealer, has joined the S. & M. Chevrolet Co., 8622 Commercial Avenue, as director of sales.

MONTREAL.—The Canadian Fairbanks Morse Co., Ltd., has added a complete stock of McQuay-Norris motor bearings.

HOUSTON, Tex.—The Firestone Tire & Rubber Company is to have a new home here. Announcement was made that a new building, providing more than 175,000 square feet of space will be erected to house the factory branch of the Firestone Company here.

WALNUT RIDGE, Ark.—James J. Sharum, president of the Sharum-Hopps Motor Company, has purchased all the stock of the company, retiring from the business. The company is agent for the Ford Motor Company.

MONTREAL.—Day-Martin, Ltd., has been appointed Canadian distributor of Pines Automatic Winterfronts, manufactured by the Pines Mfg. Co., Chicago.

EVANSVILLE, Ind.—The local Rickenbacker motor car agency, Edwin A. Aleon, manager, has been promoted to distributor rank for the tri-state territory covering southern Illinois and Indiana and western Kentucky, according to Mr. Aleon. The status of local agency has been changed from yearly contract to perpetual dealership. Mr. Aleon was recently in Harrisburg, Ill., to arrange for the opening of a retail dealer agency.

CONWAY, Ark.—C. C. Webb, formerly a salesman for the J. F. Jones Franklin Company at Little Rock and more recently connected with the Bulman Furniture Company here, has assumed his duties as manager of the James Motor Company here succeeding B. B. Drinkard.

CHICAGO.—The Chevrolet agency of Ross & Kushler, Inc., 1832 Irving Park Boulevard, has been dissolved. Mr. Ross has retained the Irving Park store while Mr. Kushler has purchased the business of the Kennedy Motor Sales, 6317 Broadway.

WINNIPEG, Man.—Lloyd Gorman, connected with the Wood, Vallance Co., Ltd., for over 15 years, has joined the accessory department of the Miller Morse Co., Ltd., also of Winnipeg.

DAYTON, O.—The Dayton Federal Truck Co. has signed a long lease on the building at 725 S. Main Street, formerly occupied by the Green Engineering Co. This move was necessary owing to increased business enjoyed by the Dayton Federal Truck Co., distributor for the Federal-Knight and heavy duty Federals.

FT. WORTH, Tex.—The Packard-Scruggs Company has added a Hudson-Essex agency to its Packard agency by appointment from the Hudson Motor Car Company of Detroit, and will handle the new line from its present location at 300 Throckmorton.

EVANSVILLE, Ind.—The Stickard Motor company at Princeton, Ky., has been signed as Willys-Knight and Overland retail dealer by the Bennighof-Nolan Company, distributor. The Stickard agency marks the 50th dealer point supplied in the Tri-State territory covering southern Indiana and Illinois and western Kentucky by the Bennighof-Nolan Company.

MONTREAL.—Paul-Smith, Reg'd, has been appointed selling agent for Quebec for Snap-On-wrench sets and tools, manufactured by the Snap-On-Wrench Co., Milwaukee.

MINNEAPOLIS.—Ford dealers from four states have closed a winter campaign sales meeting with officials of the Twin City branch. Agency managers were present from Minnesota, South Dakota, Wisconsin and Iowa. H. M. Bradford, assistant manager of the branch, presided.

CHICAGO.—The Northwest Buick Co., 3444 Lawrence Avenue, has broken ground for its new \$160,000 home at Hamlin and Lawrence Avenues.

SAN FRANCISCO.—James Warden, Jr., has been appointed manager of the Ajax division of the Pacific Nash Motor Company, with headquarters in the sales-offices of the Ajax on Van Ness Avenue, San Francisco.

MONTREAL.—Mark-Kieran & Co., have been selected Canadian representatives for the products of the Zip Abrasive Co., Cleveland, O.

JACKSONVILLE, Fla.—The Bacon Motors Co., Hudson and Essex dealer in Jacksonville and the adjacent Florida territory, has announced plans for the construction of a substantial addition to the company's Jacksonville sales rooms and service station.

MILWAUKEE.—Jung & Reul Motor Co. has been organized at Jefferson, Wis., to handle Chevrolets exclusively. Earl Jung and Roy Reul, firm members, were formerly with the Jefferson Auto Co.

CHICAGO.—The Dashiell Motor Co., 2542 South Michigan Avenue, distributors of Dodge and Graham Brothers vehicles, has opened a new display room devoted entirely to the sale of used cars at 2522 South Michigan.

PORTLAND, Ore.—Appointment of J. C. Lawson Motor Company, East 10th street and Hawthorne Avenue, as East Side representatives for Oldsmobile Company of Oregon, is announced. Prior to coming to Portland, Mr. Lawson for five years was with the factory branch of the Willys-Overland Company at Winnipeg, Canada, and for the past two years has been associated with the East Side Overland Co.

STEEBENVILLE, O.—Papers have been filed with the secretary of state chartering the Reo Service & Sales Co., with a capital of \$75,000 to operate a sales agency and service station.

CLEVELAND.—The Oakland dealer organization in the Cleveland district has been expanded by the addition of another showroom for the display of Oakland sixes. C. A. O'Hern has just opened a new Oakland display room at Chester Avenue and E. 30th Street, directly opposite the big plant of the Towell Cadillac Company.

JACKSONVILLE, Fla.—Lucian Powell, Jr., 426 W. Adams Street, Jacksonville, has been appointed as a dealer to handle Pierce-Arrow in this city, and also will act as distributor of the Pierce-Arrow in the adjacent North Florida territory. Mr. Powell also handles the Oldsmobile in the same territory, and will continue to handle this line in addition to the Pierce-Arrow.

CHICAGO.—The Dashiell Motor Co., distributors of Dodge Brothers passenger cars and Graham Brothers trucks, has opened a new branch at 3430 North Crawford Avenue, under the management of Walter Felton.

LOS ANGELES.—Val Haresnape, member of the contest board of the American Automobile Association, has accepted the general managership and vice presidency of the Al G. Faulkner, Inc., metropolitan Hudson & Essex dealer in Los Angeles.

WILMINGTON, Del.—Hammond Motors, Inc., has established a new Chevrolet agency in Wilmington, located at Thirty-fifth and Market streets. The company has a branch at Newark, Del., selling Buicks and Chevrolets.

CHICAGO.—The Ritt Motor Co., Chrysler dealer, has moved into its new building at 814 Diversey Parkway.

MILWAUKEE.—Hokanson - Thompson Inc., Oakland distributor in Wisconsin, has announced appointment of Sommer Motor Co., 1802 North Avenue, Milwaukee, as a Milwaukee Oakland dealer.

FORT WORTH, Tex.—The Smith-Swinney Motor Company has been organized here for the purpose of handling Hudson-Essex cars. The new concern is composed of O. B. Smith and J. G. Swinney and the sales rooms and service station are located at 115 Commerce street.

OGDEN, Utah.—Harbertson Bros. Motor Co. has been appointed "Music Master" radio dealers for Ogden and district.

CHICAGO.—Robert W. Grant, formerly connected with the Ford Motor Co., and more recently with the Dealers' Equipment Company, has been appointed manager of George E. Sherman & Co., Inc., authorized Ford and Lincoln dealer at 1725 West Division Street.

DALLAS, Tex.—Coincident with the introduction of the new six-cylinder Star cars J. F. Roark, district sales manager for Durant Motors, announced the formation of the Dallas Auto Sales Co., Inc., which will handle Star and Durant cars in Dallas and vicinity.

DENVER.—The Locomobile Sales Company has moved from 1520 Broadway to 1344 Lincoln Street. This building has been completely rearranged and re-decorated for the new tenants. Complete sales and service departments are being maintained at this address.

COLUMBUS, O.—The Lostro Sales Co., 207 North Fourth Street, Columbus, O., has been made agent for the Paige and Jewett lines by the Madden-Atkinson Auto Co., central Ohio distributors for those lines.

CHICAGO.—J. A. Dvoratchek, proprietor of Jack's Sales and Service, Rickenbacker and Rollin dealer, has opened a new sales room and garage at 2231 Lincoln Avenue.

MILWAUKEE.—The Merkle-Chevrolet Co. has been organized in Milwaukee with capital of \$50,000 by B. F. Anger, G. E. Merkle and R. G. Gunderson. Mr. Anger is president of the Anger-Chevrolet Co. which distributes these cars in Wisconsin.

DALLAS, Tex.—The Helm-Burks Motor Company, distributor of Hupmobiles in the Dallas territory, has occupied its new three-story fireproof home at Preston and Pacific streets. The retail sales rooms and the parts and service departments will be housed in the same building.

EVANSVILLE, Ind.—The C. F. Curtis Company, operating the Duco automobile finish service agency, has moved its shops from the Evansville Auto Exchange, First and Locust Streets, to the Evansville Nash Motor Company building, 1209-11 Main Street.

CHICAGO.—The Woodlawn Motor Car Sales and Service Co., 6136 Cottage Grove Avenue, dealer in Paige and Jewett, announces that it has added the Pierce-Arrow to its line.

OAKLAND, Cal.—The Kleiber Motor Company of San Francisco, has opened its permanent factory branch for sales and service of Kleiber cars and trucks at the corner of Eighteenth Avenue and East Twelfth Street, Oakland. This branch replaces the temporary location at 2919 Broadway. Jack Lynch, Frank J. Gasper and Clarence A. Hunt, the Kleiber Company's Alameda county representatives, are in charge of the new branch.

SPRINGFIELD, Mass.—Frederick J. Benn has accepted the position as manager of the Springfield Durant Company, handling the distribution of Star and Durant cars throughout central Massachusetts and the Connecticut valley region. Mr. Benn for three years was wholesale manager of the J. S. Harrington Company, Hudson and Essex distributor, and for four years before that time was with the Willys-Overland branch here.

With the Associations

Alabama Trades to Meet

BIRMINGHAM, Dec. 26.—Plans have been practically completed for the eleventh annual convention of the Alabama Automotive Trades Association which will be held in Montgomery, Ala., January 25 and 26 at the Exchange Hotel. The program and business arrangements have been made by Jim Farley, secretary, and when it comes to business nothing has been left out.

Mr. Farley has announced that there will be no social features during this meeting as they estimate it will take the full two days to get through with the business. Only the members of the association will be permitted to attend the meetings.

The meeting will be called to order at 10 o'clock on Monday morning by President E. W. Brownell. There will be an address of welcome by some Montgomery representative after which the president will make a talk on the necessity for getting down to business and a reasonable basis of co-operation in order to take care of the best interests of the automobile men.

Immediately after the president's address the convention will adjourn to meet in divisions to discuss matters of vital importance to special groups. Each group will be a separate meeting to be presided over by the director and to consider its own problems.

Meetings of the gas and oil division will be held under the guidance of Director Thad Holt of Birmingham, the meeting of the replacements parts division will be presided over by Director G. E. Woodward of Birmingham. Director Harper Johnson will have charge of the wholesale tires and accessories department, while Director J. H. Lord of Mobile will have charge of the retail tires and accessories division, Director R. M. Wickle of Talladega will be in charge of the Ford car division, the larger car division will be called to order by Director W. C. Stokes of Montgomery, the truck dealers' division will be directed by J. H. Shepherd of Tuscaloosa, the battery dealers' division will be directed by Frank Stephens of Montgomery and the repair men and cylinder grinders' division will be called to order by Director R. M. Hernandez of Birmingham.

On Tuesday morning at 10 o'clock the second meeting will be called to order. There will be the regular order of business, the presentation of resolutions and reports of the various committees. This will be followed by the election of officers and the selection of the meeting place for the next convention.

Los Angeles Engineers Meet

LOS ANGELES, Dec. 31.—Gasoline, detonation and changes in engine construc-

tion that might become necessary as a result of the researches conducted by the oil companies was the principal subject of discussion at the recent meeting of the Southern California Section, Society of Automotive Engineers, held at the City Club, Los Angeles. R. E. Haylett, of the Union Oil Company, led the discussion. Members of the Service Managers Association of Los Angeles were guests of the automotive engineers at the meeting.

Duesenberg Speaks at Chicago

Chicago, Dec. 26.—"Sho must had seben speeds," said one little colored fellow, helping to get some of the dirt off of Pete De Paolo's car. From under the car came a voice in contradiction, "'Tain't neither, jes two—fust, an' gone."

And many other stories both amusing and instructive were told by Fred Duesenberg before the Mid West section of the Society of Automotive Engineers here last night, when he explained many of the problems that confronted the race car designer and explained the trials and achievements in adapting superchargers to his speed creations.

"And what effect will racing design have on commercial vehicles?" he was asked.

"Not so much as in past years," he answered. "And yet I believe the supercharger can be advantageously applied to passenger and commercial cars, making it possible to use smaller engines and still have greater power, acceleration and gas economy, one of the chief advantages of the supercharger in commercial work being its ability to give uniform mixture to all cylinders. This we have been unable to get when no supercharger is used, with the result that we have had to retard the spark enough to suit the cylinders with lean mixtures, thus reducing the possible power obtainable from the other cylinders."

Speaking of the new race cars which will have 91½ cu. in. displacement, Mr. Duesenberg said that he hardly knew what the limiting r.p.m. would be, that it was determined by piston speed, also the speed with which valves could be operated, and while in making a new design it was always estimated that a certain speed would be the maximum, yet when the engine was tried out, the speed went higher, due to some factor that had not been anticipated.

St. Louis Service Men Meet

ST. LOUIS, Dec. 26.—Arthur R. Mogge, president Lewis Automobile Co., and a veteran of the industry here, was the principal speaker at a recent meeting of the Service Managers' Bureau of the St. Louis A. D. A. at Hotel Claridge. Other speakers were Dr. C. W. Cuno, chemical department, Washington University, James M. Given, Davis Boring Tool Co., William J. Bell, Norman C. Hayner Co.

Mogge Meets Dealers

ST. LOUIS, Dec. 26.—J. D. Perry Lewis, merchandising director of the A. E. A., was the chief speaker at a meeting of the Automotive Accessory Association of St. Louis at the American Annex Hotel which was attended by 156 dealers in accessories and automotive supplies, wholesale and retail, in St. Louis, St. Charles, Mo., Alton, Ill., Belleville, Ill., Wood River, Ill., Granite City, Ill., and other points close to St. Louis.

Mogge spoke on the slogan, "Give Something for the Car for Christmas." He advised the automotive merchants to utilize their show windows for attractive displays and said that the whole country is spending huge sums of money for Christmas presents and that the automotive dealer has hundreds of items in stock which would make appropriate gifts.

Robert E. Lee, secretary-manager of the St. Louis A. D. A. extended an invitation to the accessory men to attend the N. A. D. A. sales Congress at Moolah Temple Dec. 14.

President Dan F. Hyland of the A. A. A. of St. Louis, who presided, appointed as a committee on program to arrange for three successive meetings of the association in January, February and March, Frank Quan of Fred Campbell Supply Co., George H. Niekamp of Beck & Corbitt Supply Co. and Stuart Campbell.

Finance Decision Discussed

RALEIGH, N. C., Dec. 26.—Representatives of automobile financing companies and a committee representing the North Carolina Automotive Trade Association held a conference here recently with the North Carolina department of revenue, when administration of the title law and repossession of cars was discussed in the light of recent court decisions. These decisions were regarded as favorable to the dealers and financing companies, but require certain recording of papers, including the mortgages and notes, as protective measures.

Indianapolis Plans Show

INDIANAPOLIS, Dec. 26.—The Indianapolis Automobile Trade Association has sent out announcements and applications for space for the Indianapolis Automobile Show which this year will be staged from February 15 to 20.

"Placing the show two weeks earlier than usual this year," says John B. Orman, manager, "the directors believe the early spring business will be greatly benefited. Up to this time the local show has been held during the early part of March, but directors and dealers have come to believe that such a date is altogether too late in these days when the show building is always adequately heated no matter what the weather."

Coming Motor Events

Automobile Shows

New York.....Jan. 9-15 National Automobile Show in Grand Central Palace.	Washington.....Jan. 30-Feb. 6 Automobile show under auspices of Washington Automotive Trade Association in Washington Auditorium Building, Rudolph Jose, manager.	Hartford, Conn......Feb. 20-27 Automobile show by Hartford Automobile Dealers' Association in State Armory, Arthur Fifoot, manager, Hotel Bond.
Newark, N. J......Jan. 16-23 Nineteenth annual Automobile Show under auspices of New Jersey Automobile Exhibition Co., Chamber of Commerce Building.	Washington.....Jan. 30-Feb. 6 Washington Trade Association Show in Auditorium Building.	St. Louis.....Feb. 20-27 19th Annual Automobile Show, City Market Bldg., St. Louis Automobile Dealers Assn.
Buffalo, N. Y......Jan. 16-23 Buffalo automobile show by Buffalo Automobile Dealers' Association in 174th Regimental Armory, Carlton, C. Proctor, manager, headquarters, Hotel Statler.	Chicago.....Jan. 30-Feb. 6 Twenty-sixth Annual National Automobile Show and Eleventh Annual Automobile Salon.	Grand Rapids, Mich......Feb. 22-27 Seventeenth Annual Show by Passenger Car Dealers Association.
Milwaukee.....Jan. 16-23 18th Annual Automobile Show, Auditorium.	San Francisco.....Jan. 30-Feb. 6 Tenth annual Pacific Automobile Show under direction of Motor Car Dealers' Association of San Francisco, in Exposition Auditorium, G. A. Wahlgreen, 215-16 Humboldt Bank Bldg., manager.	Peoria, Ill......Feb. 22-27 Fifteenth Automobile & Accessories Show, Peoria Automobile Dealers' & Accessories Assn.
Cincinnati.....Jan. 16-23 Cincinnati Music Hall, Cincinnati Automobile Dealers Association.	Cumberland, Md......Feb. 1-6 Automobile Show in New Armory, Automobile Dealers Assn. of Cumberland.	Omaha.....Feb. 22-27 Twenty-first Annual Automobile Show under auspices Omaha Automobile Trade Association, Inc., in Municipal Auditorium, A. B. Waugh, manager.
Philadelphia.....Jan. 16-23 25th Annual Automobile Show at Commercial Museum Under Auspices Phila. Automobile Trade Assn.	Denver.....Feb. 2-6 Annual automobile show under auspices of Denver Automobile Dealers' Association, in Municipal Auditorium, Myron L. Smith, chairman of committee.	Wilmington, Del......Mar. 1-6 11th Annual Show, Hotel duPont, Wilmington Automobile Trade Assn.
Columbus, O......Jan. 18-23 Show in Motor Hall by Columbus Automobile Dealers Co.	Atlantic City, N. J......Feb. 2-9 Auto Show on Million Dollar Pier by Atlantic City Auto Dealers Assn.	Boston.....Mar. 6-13 Boston Automobile Show under auspices of Boston Automobile Dealers' Association, Inc., and Boston Commercial Motor Vehicle Association, Inc., in Mechanics' Building, Chester I. Campbell, manager, 329 Park Square Bldg.
Elmira, N. Y......Jan. 18-23 16th Annual Show, Elmira Automobile Merchants Assn., Inc., N. Y. State Armory.	Springfield, Ill......Feb. 3-6 Seventh Annual Show in State Arsenal by Springfield Auto Dealers Assn.	Ft. Worth, Tex......Mar. 6-14 Show in Auto Building at Southwestern Fat Stock Show and Rodeo by Ft. Worth Automotive Trades Assn.
Kalamazoo, Mich......Jan. 19-23 Automobile Show in Armory by Kalamazoo Automobile Trade Association	Providence, R. I......Feb. 6-13 Providence automobile show under auspices R. I. Automobile Dealers' Association, Chester I. Campbell, manager, 617 Industrial Trust Bldg.	
Baltimore.....Jan. 23-30 20th Annual Automobile Show and Second Annual Motor Boat Exhibit, 5th Regiment Armory, Baltimore Automobile Trade Assn., Inc.	Toledo, O......Feb. 8-13 Annual show of Toledo Automotive Trades Association in Civic Center Garage, T. J. Cooper, manager, 925 Jefferson Avenue.	
Brooklyn.....Jan. 23-30 Fifteenth Annual Automobile Show in 23rd Regiment Armory, under auspices of Brooklyn Motor Vehicle Dealers Association.	Schenectady, N. Y......Feb. 8-13 Fifth Annual Automobile Show in State Armory by Schenectady Automotive Dealers Assn.	
Detroit.....Jan. 23-30 Detroit Auto Show in Convention Hall by Detroit Automobile Dealers Assn.	Syracuse, N. Y......Feb. 8-13 18th Annual Auto Show, State Armory, Syracuse Automobile Dealers Association, Inc.	
Cleveland, O......Jan. 23-30 1926 Automobile Show under auspices of Cleveland Automobile Manufacturers' and Dealers' Association, Herbert Buckman manager, in Public Auditorium.	Kansas City, Mo......Feb. 13-20 American Royal Bldg.—20th Annual Show, direction of K. C. Motor Car Dealers Association.	
Jersey City.....Jan. 25-30 Jersey City Automobile Show in National Guard Armory.	Des Moines.....Feb. 14-20 17th Annual Automobile Show in Coliseum by Des Moines Automobile Dealers Association.	
Rochester, N. Y......Jan. 25-30 18th Annual Automobile Show, Edgerton Park, Rochester Automobile Dealers Assn.	Indianapolis.....Feb. 15-20 Auto Show Bldg.—15th Annual Motor Show, direction Indianapolis Auto Trade Association.	
Williamsport, Pa......Jan. 25-30 Automobile Show by Williamsport Automobile Dealers Assn.	Louisville, Ky......Feb. 15-20 Louisville Automobile Show, Armory, under the auspices of the Louisville Automobile Dealers Association, J. Garland Lea, manager.	
Scranton, Pa......Jan. 25-30 Passenger Car Show in Armory, Scranton Motor Trades Assn.	Logan, W. Va......Feb. 15-20 Logan Automobile Show under auspices of Logan Automobile Dealers' Association.	
Lowell, Mass......Jan. 25-Feb. 1 Twelfth Automobile Show in Memorial Auditorium, Automobile Merchants Assn. of Lowell, Inc.	Great Falls, Mont......Feb. 16-20 Eleventh Annual Show by Montana Auto Distributors Association.	
Harrisburg, Pa......Jan. 30-Feb. 6 Harrisburg Automobile Show under auspices of Harrisburg Motor Dealers' Association.		

Conventions

New York.....Jan. 11-13 Second World Motor Congress, under auspices of National Automobile Chamber of Commerce.	Chicago.....Feb. 1-3 Ninth Annual Convention of National Automobile Dealers Association in La Salle Hotel.
Chicago.....Feb. 2, 3 Convention of Automotive Electric Service Association in Congress Hotel.	Springfield, Ill......Feb. 8, 9 Sixth Annual Meeting of Illinois Automotive Trade Association in the Abraham Lincoln Hotel.
Chicago.....Feb. 9-16 American Drivurself Association Annual Convention.	Winston-Salem, N. C......Mar. 17, 18 Annual Convention of North Carolina Automotive Trade Association.
Galveston, Tex......May 12-13 Tenth annual convention of Texas Automotive Dealers' Association in Galvez Hotel.	

Foreign Shows

MontrealJan. 23-30 1926 Motor Show under the auspices of Montreal Automobile Trade Association, Theo Dorian, manager.	London and BirminghamFeb. 16-26 British Industries Fair of 1926.
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Coming Feature Issues of Chilton Class Journal Publications

January 1—National Shows Number—Automobile Trade Journal.
January 7—Motor Age—National Shows Number.

January 14—Motor World Wholesale—New York Show Report.
February 4—Motor Age—Chicago Show Number.

February 4—Motor World Wholesale—Chicago Show Report.
February 18—Automotive Industries—Statistical Issue.

South Dakota Tradesmen Hold Big Annual Session

Dan G. Urquhart Is Re-elected President of Association at Aberdeen Convention

HURON, S. D., Dec. 26.—With a registration of nearly 400, the Automobile Trades Association of South Dakota recently held in Aberdeen the largest and most enthusiastic convention since the organization was founded. A full two-day's program covered the items of interest to those in the automobile business, and indications point to a most successful year for 1926.

The convention was addressed by H. W. Shelby, district manager of the National Cash Register Company on the subject, "Face the Facts." Mr. Shelby's careful survey of the automobile and garage business in South Dakota in connection with his business enabled him to impart some valuable information to those present. Following his address the convention entered into a general discussion of the laws that had been passed at the last session of the legislature, and in connection with these laws, Buell F. Jones, attorney general, discussed those laws pertaining to the confiscating of personal property that has been used in the violation of the state prohibitions laws.

J. J. Murphy, chairman of the board of the railroad commission discussed the bonded warehouse law, and E. S. Goff and George Henry, director and registrar of the motor vehicle department of the office of the secretary of state, discussed the motor vehicle laws, and particularly the certificate of title law. Many points that had been misunderstood by dealers were fully explained by the officers present.

In the evening the annual banquet was held in the dining room of the Sherman Hotel, and the attendance was so large that 150 had to be accommodated in an adjoining room. The Automobile Association of Aberdeen provided an entertainment, following which those present listened to a short address by R. E. McCarthy of the Alexander Hamilton Institute on the subject of "Automobile Merchandising." After his address the principal address was given by W. V. Harrington, president of the Harrington Motor Company of Minneapolis, and a director of the National Automobile Dealers' Association. Mr. Harrington's subject was "Associations," and his address was well received by all present. After the banquet a dance was held in the new building of the Hatfield Motor Supply Company for all the visitors who cared to take part in this form of amusement.

The program the following morning was opened by an address given by R. D. Baldwin, of R. D. Baldwin & Company, Aberdeen, public accountants. Mr. Baldwin's subject was "Control" and he dealt with the necessity for good accounting systems in all places of business. Following this address the association was

Dealer Uses "Dog-Eat-Dog" System

BUFFALO, N. Y., Dec. 26.—The Meyer Motor Company, Studebaker distributor in Buffalo, uses what it calls the "dog-eat-dog" system in paying salesmen's commissions. Under this plan the commission for selling a car goes to the salesman, who actually puts the sale across, regardless of what may have been done by any other salesman in the way of luring the prospect to the dotted line.

Does it work?

It does.

The plan has been operative with this concern more than a year. From October 15, 1924, to October 15, 1925, using this system, the company sold 1,062 cars. The highest previous record of sale of Studebakers in Buffalo in a corresponding period, is said to have been 635. The company's executives do not credit the dog-eat-dog system with the sale of all of the cars disposed of in the period mentioned. It was partly due, they say, to improvements in the Studebaker car, and to its growing popularity.

Before adopting the present plan the Meyer people used many years a form of the protective file system, commonly employed in retail automobile merchandising, and under which it a salesman digs up a prospect and nurses him along—or pretends to—he gets the commission if that prospect is ever sold.

favoring with a series of talks by three representatives of manufacturers of shop equipment. These three men, O. H. Leidy, representing the L. S. Sterrett Company, R. B. Belling, representing the Black & Decker Manufacturing Company, and B. F. Kragtorp, representing the McQuay-Norris Manufacturing Company, discussed the repair shop and the necessity for proper tools and shop equipment.

The afternoon session was addressed by Ex-Governor C. N. Herreid, president of the Citizens Trust and Savings Bank of Aberdeen, on the subject of the automobile finance problem. Following his address, F. H. Rash, a representative of the Surety National Detective Bureau of Sioux Falls, discussed before the convention the subject of "Protection." A short talk was also given by Teddy Roe representing the Standard Unit Parts Corporation on the subject of "Buy at Home." This completed the addresses and the convention then listened to the report of the committee.

Following a general discussion the convention elected a board of directors for the ensuing year as follows: Dan Urquhart, Huron, Elmer Judy, Aberdeen, George Dresser, Mitchell, G. H. Evans, Sioux Falls, A. B. McGowan, Redfield, E. J. Hanson, Watertown, O. M. Saylor of Rapid City, and E. P. Johnson of Brookings.

Immediately after the adjournment the board of directors elected the following officers for the coming year: Dan Urqu-

The company found that this plan made the salesmen indifferent to all prospects save their own. When the prospect of some other salesman came in the man on the floor, for example, would make no effort to close him up. Why should he bother? The commission would go to some one else. Chilled by this indifference the prospect would often walk out. Also it was found that under the old system salesmen were carrying a lot of dead-wood as prospects and pretending to keep in touch with them, hoping they might some time come to life and buy. This entailed use of a lot of time and energy on the part of executives whose duty it was to check up the lists of prospects. These were wasted.

The dog-eat-dog system was submitted to the sales force before it was adopted and was approved by a majority vote. It speedily eliminated the "weak sisters" on the force. Only the live ones were able to stand the gaff. It creates hard feelings now and then among the salesmen but the company's executives do not experience much trouble in smoothing these over. The system has stimulated search on the part of the salesmen for prospects and has kept the company supplied at all times with live ones to solicit.

hart, Huron, president; Fred J. Varie, Deadwood, vice-president; E. R. Judy, Aberdeen, treasurer; H. M. Whisman, Huron, secretary-manager. Watertown, South Dakota, was elected for the meeting place for 1926.

One of the outstanding features of the convention this year was the holding of an accessories and parts exposition in the same building in which the convention was held. About 25 firms manufacturing tires, equipment and supplies of one kind or another had fine exhibits on display.

EXTRA GENERAL DIVIDEND

AKRON, Dec. 26.—A Christmas bonus in the form of an extra 6 per cent dividend on common stock has accompanied letters mailed to stockholders of the General Tire & Rubber Co., announcing the company's annual meeting, which will be held today. As the regular common stock dividends have been on an 8 per cent basis for 1925, this brings the total common dividend disbursement for the year to 14 per cent.

EMPLOYMENT INCREASES

MOLINE, Dec. 26.—More than 600 men are now employed at the East Moline plant of the Yellow Sleeve-Valve Engine Works. This is a 100 per cent increase over a year ago. By spring it is stated the force will be increased by another hundred, according to Louis Ruthenberg, general manager.

Prices and Weights of Current Passenger Car Models

SHIP. WT. PASS. BODY STYLE. PRICE	SHIP. WT. PASS. BODY STYLE. PRICE	SHIP. WT. PASS. BODY STYLE. PRICE	SHIP. WT. PASS. BODY STYLE. PRICE
AJAX	CHRYSLER (Continued)	ELCAR	JEWETT
108 in. W. B.	"Six" (112 3/4 in. W. B.)	"4-55"	"New Day"
2210 5-p Touring \$865	2805 4-p Roadster \$1,625	2560 5-p Touring \$1,095	5-p Sedan \$ 995
2410 5-p Sedan 995	2785 5-p Phaeton 1,395	2900 5-p Coach 1,195	5-p Sedan de Luxe 1,095
APPERSON "6"	2895 5-p Coach 1,445	2779 5-p Sedan 1,395	
3100 5-p Phaeton \$1,575	2935 4-p Coupe 1,795		JORDAN
3130 5-p Sp. Phaeton 1,650	2995 5-p Brougham 1,865		"J"
3145 4-p Coupe 2,050	3060 5-p Sedan 1,695		4-p Playboy Road. \$1,695
3570 5-p Sp. Sedan 2,100	3085 5-p Imperial Sedan 1,995		5-p Sedan 1,845
"ST. 8"	3090 5-p Crown Sedan 2,095		
3520 5-p Sp. Phaeton \$1,995			Series "A"
3750 4-p Coupe 2,450	(118 3/4 in. W. B.)		3340 5-p Touring 2,275
3790 5-p Sedan 2,595	3225 5-p Town Car \$3,725		3625 5-p Brougham 2,575
AUBURN	CLEVELAND "31"		3525 5-p Sedan 2,675
"4-44"	2415 5-p Touring \$895		3470 7-p Sedan 2,925
5-p Touring \$1,145	2565 5-p Tour'g DeLuxe 1,025		
5-p Roadster 1,145	2520 3-p Coupe 975		KISSEL
5-p Coupe 1,175	2695 5-p Sedan 995		"55"
5-p Sedan 1,195			3130 2-p Speedster \$1,795
"6-66"			2-p Sp'dster DeL. 2,085
2850 4-p Sport-Roadster 1,395	2775 5-p Touring \$1,095		4-p Speedster 1,895
2860 6-p Touring 1,395	2950 5-p Sp. Touring 1,195		4-p Sp'dster DeL. 2,185
3020 3-p Coupe 1,445	3000 5-p Coach 1,295		3530 3-p Enc. Speedster 2,085
3020 5-p Brougham 1,495	2890 3-p Coupe 1,175		4-p Enc. Speedster 2,185
3070 5-p Sedan 1,695	3120 5-p Sedan 1,295		4-p Enc. Spd. DeL. 2,685
3070 5-p Wanderer 1,745	3190 5-p Sedan DeLuxe 1,595		2-p Enc. Spd. DeL. 2,585
"8-88"	3190 5-p Sport Sedan 1,625		3190 4-p Tourster 1,795
3180 3-p Sport-Roadster 1,695	CUNNINGHAM		4-p Tourster DeL. 1,985
3200 6-p Touring 1,695	"V-8"		2-p Phaeton 1,585
3380 3-p Coupe 1,745	4600 7-p Touring \$6,650		3170 5-p Phaeton DeL. 1,785
3380 5-p Brougham 1,795	4500 4-p Sp. Touring 6,150		7-p Touring 1,685
3450 5-p Sedan 1,995	4700 4-p Coupe 7,600		7-p Touring DeL. 1,885
3450 5-p Wanderer 2,045	5000 6-p Limousine 8,100		4-p Coupe 2,085
3750 7-p Sedan 2,095	DAGMAR		4-p Coupe DeL. 2,485
BUICK	"6-70"		3540 5-p Broug. Sedan 1,995
"Standard"	3750 4-p Roadster \$3,500		5-p Brg. Sed. DeL. 2,485
2845 2-p Roadster \$1,125	3800 4-p Sp. Tourer 3,500		5-p Brougham 2d. 1,695
2955 5-p Touring 1,150	3700 4-p Phaeton 3,500		4070 7-p Sedan De Luxe 3,085
3020 2-p Coupe 1,195	4200 4-p Petite Coupe 4,500		4010 7-p Ber. Sed. DeL. 3,185
3150 4-p Coupe 1,275	3590 5-p Petite Sedan 2,540		3530 5-p Victoria 2,185
3230 5-p 4 d. Sedan 1,295	4500 4-p De Luxe Coupe 4,750		3400 5-p Victoria DeL. 2,485
3110 5-p 2 d. Sedan 1,195	4700 5-p Sedan 4,700		
"Master"	4800 7-p Sedan 4,750		
(120 in. W. B.)			
3350 2-p Roadster \$1,250	3100 4-p Roadster \$1,985		
3515 5-p Touring 1,295	3200 4-p Sp. Touring 1,985		
3670 5-p Sedan 1,495	3150 5-p Touring 1,785		
3765 5-p 2 d. Sedan 1,395	3500 5-p Sedan 2,445		
(128 in. W. B.)	DAVIS		
3570 3-p Sp. Roadster \$1,495	"90"		
3635 5-p Sp. Touring 1,525	2650 4-p M. o' W. Road. \$1,495		
3855 4-p Country Club 1,765	2915 4-p Legionaire T'r. 1,495		
3805 4-p Coupe 1,795	2750 5-p Phaeton 1,395		
4025 5-p Brough. Sedan 1,925	3070 5-p Sedan 1,595		
3940 7-p Sedan 1,995	3070 5-p Imperial Sedan 1,795		
CADILLAC	3065 5-p Berline Sedan 1,795		
"314" Standard Line			
(132 in. W. B.)	2835 4-p Roadster 1,795		
4040 2-p Coupe \$3,045	3020 5-p Phaeton 1,695		
4155 5-p Sedan 3,195	3245 5-p Sedan 1,895		
4240 7-p Sedan 3,295	3245 5-p Imperial Sedan 2,095		
4075 5-p Brougham 2,995	3215 5-p Berline Sedan 2,095		
4360 7-p Imperial 3,435	DIANA "St. 8"		
4115 4-p Victoria 3,095	2970 5-p Roadster \$1,895		
Custom Built	3100 5-p Phaeton 1,895		
(132 in.)	3245 5-p Std. Sedan 2d. 1,995		
3920 5-p Roadster \$3,250	3245 5-p DeLuxe Sedan 2,195		
(138 in. W. B.)	3130 5-p Cabriolet 2,095		
4300 7-p Touring \$3,250	3140 5-p Sedan de Luxe 2,095		
3960 5-p Phaeton 3,250	3140 5-p Sedan (135 in. W. B.)		
4190 5-p Coupe 4,000	DODGE BROTHERS		
4190 5-p Sedan 4,150	2473 2-p Roadster \$885		
4250 7-p Suburban 4,285	2593 2-p Special Roadster 955		
4355 7-p Imperial 4,485	2567 5-p Touring 875		
CASE	2695 5-p Spl. Touring 975		
J. I. C.	2708 2-p Coupe "B" 960		
3260 3-p Roadster \$1,840	2823 2-p Spl. Coupe "B" 1,060		
3290 5-p Touring 1,885	2995 5-p "B" Sedan 1,045		
3470 5-p Sp. Touring 2,160	3077 5-p Spl. "B" Sed. 1,145		
3570 4-p Sub. Coupe 2,480	3020 5-p Sedan "A" 1,195		
3640 5-p Sedan 2,590	3107 5-p Spl. "A" Sedan 1,280		
3650 5-p Brougham 2,590	2723 5-p Coach 1,035		
"Y"	2823 5-p Spl. Coach 1,135		
3950 7-p Touring \$2,225	DUESENBERG		
4320 7-p Sedan 2,975	Straight "8"		
CHANDLER "35"	3920 2-p Roadster ↑		
3080 2-p Roadster \$1,695	3970 4-p Roadster ↑		
3085 5-p Sport Touring 1,495	3700 5-p Phaeton \$6,650		
3223 7-p Touring 1,595	3980 4-p Sp. Phaeton ↑		
3309 5-p Brougham 1,695	4115 5-p Sedan ↑		
3525 5-p Met. Sedan 1,795	4500 7-p Sedan ↑		
3498 5-p 20th C'y Sedan 1,490	↑Manufacturers do not quote list prices.		
3594 7-p Sedan 1,895	DU PONT		
CHEVROLET	"D"		
"Superior" (Series K)	3300 2-p Roadster \$2,600		
1730 2-p Roadster \$525	3550 5-p Touring 2,600		
1875 5-p Touring 525	3800 7-p Touring 2,750		
2030 2-p Utility Coupe 675	3550 5-p Touring Sedan 3,400		
2130 5-p Coach 695	DURANT		
2215 5-p Sedan 775	A-22		
CHRYSLER "Four"	2300 5-p Touring \$ 810		
(109 in. W. B.)	2380 5-p Spec. Touring 930		
2308 5-p Touring \$895	2450 4-p Coupe 1,090		
2405 2-p Club Coupe 995	2480 4-p Spec. Coupe 1,160		
2510 5-p Coach 1,045	2650 5-p Sedan 1,160		
2570 5-p Std. Sedan 1,095	2710 5-p Spec. Sedan 1,280		

Prices and Weights of Current Passenger Car Models

SHIP. WT. PASS. BODY STYLE. PRICE McFARLAND "G" (Continued)

3850	4-p	Coupe	3,180
3850	5-p	Sedan	3,180
3850	5-p	Spec. Sedan	3,180
3850	7-p	Sedan	3,280
3850	5-p	Sub. Sedan	3,380
3850	7-p	Sub. Sedan	3,480
3850	5-p	Brougham 4d.	3,180

4000	2-p	Roadster	5,400
4600	4-p	Sp. Touring	5,600
4900	4-p	Coupe	6,720
5200	4-p	Tour. Sedan	6,720
5200	7-p	Tour. Sedan	6,810
5200	6-p	Sedan	6,720
5200	7-p	Sedan	6,810
5200	7-p	Spec. Sedan	6,810
5200	7-p	Enc. Sedan	7,110
5200	7-p	Sub. Sedan	7,110
5200	7-p	Town Car	9,000

5200	2-p	"Straight" "g"	2,650
5200	4-p	Roadster	2,900
5200	5-p	Touring	2,650
5200	7-p	Touring	2,750
5200	5-p	Sedan	3,180
5200	5-p	Sub. Sedan	3,380
5200	7-p	Sedan	3,280
5200	7-p	Sub. Sedan	3,480
5200	4-p	Coupe	3,180
5200	5-p	Coach Brough.	3,180
5200	5-p	Town Car	4,600

3695	2-p	Roadster	\$3,295
3604	5-p	Phaeton	3,295
3704	7-p	Touring	3,295
3799	5-p	Brough. Coupe	3,295
3754	4-p	Victoria Coupe	3,295
3616	2-p	Std. Coupe	3,295
3369	5-p	Sedan	3,295
3859	5-p	Sedan De Luxe	3,775
3999	7-p	Sedan	3,370
3974	7-p	Sedan De Luxe	3,850
3969	5-p	Sedan Lim.	3,900
3999	7-p	Sedan Lim.	3,975

2490	5-p	Roadster	\$1,395
2675	5-p	Cab. Roadster	1,595
2510	5-p	Touring	1,195
2750	5-p	Coach	1,395
2750	5-p	DeL. Sedan 2d.	1,495
2850	5-p	Std. Sedan 4d.	1,545
2850	5-p	DeL. Sedan 4d.	1,695

3270	5-p	London	1,985
3290	7-p	Sp. Touring	1,985
3590	5-p	Petite Sedan	2,540

2870	2-p	"Special"	\$1,115
2980	5-p	Roadster	1,135
3030	2-p	Touring	1,135
3120	2-p	Business Coupe	1,165
3120	5-p	Sedan 2 d.	1,215
3300	5-p	Sedan 4 d.	1,445

3320	3-p	"Advanced"	1,375
3400	5-p	Roadster	1,340
3550	5-p	Touring	1,425
3550	5-p	Sedan 2 d.	1,425

3480	7-p	"Advanced"	1,490
3640	4-p	Touring	1,790
3750	5-p	Victoria	1,990
3830	7-p	Coupe 4 d.	2,090
3830	7-p	Sedan	2,090

2435	2-p	OAKLAND "g"	\$975
2500	5-p	Roadster	1,025
2640	5-p	Touring	1,095
2615	3-p	Coach	1,095
2765	3-p	Landau Coupe	1,125
2765	5-p	Sedan	1,195
2885	5-p	Landau Sedan	1,295

2235	5-p	OLDSMOBILE "30"	\$875
2445	5-p	Touring	980
2480	5-p	Sp. Touring	980
2680	5-p	Coach	950
2680	5-p	De Luxe Coach	1,040
2535	5-p	Sedan	1,025
2735	5-p	De Luxe Sedan	1,115

1919	5-p	OVERLAND "91" 4	\$495
2080	2-p	(100 in. W. B.)	625
2205	5-p	Touring	695
2302	5-p	Sedan De Luxe	695
2302	5-p	Std. Sedan 2 d.	595

SHIP. WT. PASS. BODY STYLE. PRICE OVERLAND (Continued)

2443	5-p	"93" 6	895
2584	5-p	(112½ in. W. B.)	1,095
2443	5-p	Sta. Sedan	895
2584	5-p	Sedan De Luxe	1,095

3643	4-p	PACKARD "g"	\$2,785
3653	5-p	Roadster	2,585
3595	4-p	Touring	2,750
3753	4-p	Sp. Touring	2,585
3937	5-p	Coupe	2,585
3937	5-p	Sedan	2,585
3793	7-p	(133 in. W. B.)	2,785
4043	7-p	Touring	2,785
4043	7-p	Sedan	2,785
4143	7-p	Club Sedan	2,725
4143	7-p	Sedan Lim.	2,885

4060	4-p	"g"	3,950
4090	5-p	(136 in. W. B.)	3,750
4023	4-p	Runabout	3,900
4242	4-p	Touring	3,900
4528	4-p	Sp. Touring	4,750
4528	5-p	Coupe	4,750
4528	5-p	Sedan	4,750
4199	7-p	2-p Coupe	5,775
4199	7-p	(143 in. W. B.)	3,950
4655	5-p	Touring	4,890
4710	7-p	Club Sedan	5,000
4710	7-p	Sedan	6,100
4710	7-p	Sedan Lim.	6,100

3875	4-p	PAIGE "21-24"	\$2,165
3935	7-p	Phaeton	2,165
4325	5-p	Phaeton	2,165
4325	5-p	Sedan De Luxe	2,395
4325	7-p	Sedan De Luxe	2,840

3175	5-p	PEERLESS "6-72"	\$1,895
3425	5-p	(126 in. W. B.)	2,295
3500	5-p	Touring	2,395
3500	5-p	Coupe	2,395
3500	5-p	Sedan	2,395

3275	2-p	(133 in. W. B.)	2,195
3300	7-p	Roadster	1,995
3700	7-p	Touring	2,595
3825	7-p	Sedan	2,695
3825	7-p	Limousine	2,695

3310	5-p	"6-80"	\$1,495
3310	5-p	(116 in. W. B.)	1,595
3310	5-p	Sedan	1,495
3310	5-p	Std. Sedan	1,595

3950	4-p	"8-67"	2,845
3995	7-p	Phaeton	2,845
4300	5-p	Phaeton	2,845
4310	5-p	Tn. Brougham	3,495
4400	7-p	Town Sedan	3,495
4525	7-p	Sub. Sedan	3,595
4100	4-p	Berline Lim.	3,795
4150	4-p	Victoria Coupe	3,245
4150	5-p	Sub. Coupe	3,295

4350	2-p	PIERCE-ARROW "33"	\$5,250
4500	4-p	Runabout	5,250
4590	7-p	Touring	5,250
4730	7-p	Touring	5,250
4800	3-p	Coupe	6,800
4800	4-p	Sedan	6,900
4750	7-p	Sedan	7,000
4750	4-p	Coupe Sedan	6,900
4730	6-p	Brougham	6,800
4850	7-p	Limousine	7,000
5060	7-p	Enclosed Lim.	7,000
4780	7-p	French Lim.	7,000
4730	6-p	Landaulet	7,000

3205	2-p	REO "80"	2,895
3260	4-p	Roadster	3,095
3385	7-p	Phaeton	2,895
3430	5-p	Coach	3,150
3365	4-p	Coupe Landau	3,150
3335	4-p	Coupe	3,395
3440	5-p	Sedan	3,395
3560	7-p	Sedan	3,395
3615	7-p	Enc. Dr. Lim.	4,045

3350	2-p	REO "T-6"	\$1,665
3182	5-p	Roadster	1,395
3250	2-p	Sp. Touring	1,495
3400	5-p	Coupe	1,565
3400	5-p	Sedan 4 d.	1,565
3400	5-p	Spec. Sedan	1,745

3900	2-p	REVERE "25"	\$2,750
3975	4-p	Sp. Roadster	2,750
4050	5-p	Speedster	2,750
4300	5-p	Touring	2,750
4300	5-p	Sedan	3,800

3700	2-p	"M"	3,200
3800	4-p	Roadster	3,200
3970	4-p	Sportster	3,200
4400	5-p	Touring	3,200
4400	5-p	Sedan	4,000

SHIP. WT. PASS. BODY STYLE. PRICE RICKENBACKER "E"

"E"			
(117 in. W. B.)			
*****	5-p	Touring	\$1,750
*****	7-p	Touring	1,795
*****	*****	Roadster	1,795
*****	5-p	Coupe	1,695
*****	5-p	Brougham	1,895
*****	4-p	Coupe Roadster	1,920
*****	4-p	Coupe De Luxe	1,995
*****	5-p	Sedan	2,095
*****	7-p	Sedan	2,195
"D."			

D-8		
(121½ in. W. B.)		
*****	Roadster	\$2,195
*****	5-p Touring	2,150
*****	7-p Touring	2,195
*****	5-p Coupe Sedan	2,095
*****	5-p Brougham	2,295
*****	4-p Coupe Roadster	2,320
*****	4-p Coupe De Luxe	2,395
*****	5-p Sedan	2,495
*****	7-p Sedan	2,595

2-p	ROAMER "6-50-55" (115 in. W. B.)	\$1,385
5-p	Roadster	1,245
5-p	Spec. Tourer	1,245
2-p	Bus. Coupe	1,495
5-p	Coupe	1,495
5-p	Sedan DeLuxe	1,695

4-p	"6-54-E" (118-138 in. W. B.)	2,385
4-p	Roadster	1,985
4-p	Tourer	2,285
4-p	Sport	2,285
7-p	Tourer	2,285
3-p	Cabriolet	2,750

2-p	"4-75-E" (128 in. W. B.)	3,485
3-p	"Custom Built"	3,285
4-p	Speedster	2,985
4-p	Sport	3,285
4-p	Tourer	2,985

4-p	"8-88" (138 in. W. B.)	2,750
5-p	Roadster	2,750
5-p	Sport	2,750
5-p	Tourer	2,495
7-p	Tourer	2,585
2-p	Speedster	2,985
3-p	Cabriolet	2,950
5-p	Spec. Sedan	3,785
7-p	Sedan (136-in. W. B.)	3,285
5-p	Brougham	2,895

Chassis	ROLLS-ROYCE	††
†† Manufacturers do not quote list prices.		

3400	5-p	STANLEY "252"	\$2,500
3800	5-p	Phaeton	3,300
3800	5-p	Sedan	3,300

STAR			
.....	5-p	Touring	525
.....	2-p	Coupester	610
.....	5-p	Sedan 4 d.	805
Standard "6"			
.....	.....	Coupester	\$745
.....	.....	Coupe	820
.....	5-p	Coach	880

STEARNS-KNIGHT		
"B" (4)		
..... 4-p	Coupe R'dster	\$1,795
3775 5-p	Touring	1,595
4250 5-p	Sedan	2,095
3750 4-p	Coupe Br'ham	1,895
..... 5-p	Brougham	2,095

		"S" (6)	
.....	2-p	Roadster	2,495
3775	5-p	Touring	2,395
3850	7-p	Touring	2,495
4025	2-p	Coupe	3,395
4275	4-p	Sp. Coupe	3,150
3950	5-p	Sedan	2,945
4275	7-p	Sp. Brougham	3,395
.....	4-p	Sp. Sedan	3,395
		"C" (6)	

525	4-p	Touring	1,875
540	5-p	Touring	1,875
550	2-p	Sport Coupe	2,185
650	5-p	Coupe Br'ham	2,285
700	5-p	Sedan	2,475
700	5-p	Brougham	2,475
.....	5-p	Brough. Sedan	2,480

5300	2-p	STEVENS-DURYEA	\$3,150
5500	7-p	Roadster	7,500
5425	4-p	Touring	7,750
5600	4-p	Sp. Touring	9,000
5730	4-p	Coupe	10,000
5850	6-p	Sedan	9,675
5750	6-p	Town Brough.	10,175
6100	6-p	Vestibule Lim.	9,675
6210	7-p	Vestibule Lim.	10,175
6150	7-p	% Limousine	10,175
6200	7-p	Cabriolet	10,175

SHIP. WT. PASS. BODY STYLE. PRICE STUDEBAKER

2760	3-p	Standard Six	
2810	3-p	Du. Roadster	\$1,125
2870	3-p	Sport Roadster	1,295
2945	5-p	Du. Phaeton	1,145
2980	3-p	Country Club	1,195
3260	5-p	Coach	

This list comprises cars distributed on a national basis

[illegible]

(Continued on page 48)



Due now to the great and increasing popularity of the new 90-degree Cadillac, as well as the lower Cadillac prices, the legitimate market for Cadillac is very greatly enlarged.

Therefore, there now exists a very real business opportunity for a dealer to sell Cadillacs in many cases where it never existed before.

You may be interested — and you may be rightly situated. If you feel that you are, write us fully. Your letter will be held confidential.

CADILLAC MOTOR CAR COMPANY, DETROIT
DIVISION OF GENERAL MOTORS CORPORATION

New 90 Degree

C A D I L L A C

(This list comprises cars distributed on a national basis)

MAKE AND MODEL			Wheel Base (Inches)	ENGINE										ELECTRICAL SYSTEM		REAR AXLE		BRAKES		Chassis Lubrication—Type and Make		ABBREVIATIONS—NAMES OF MFRS. OF STOCK PARTS								
Make and Model	Number of Cyls.	Rated H.P.	Plat. Dis.	Valve Arrange-ment	Camshaft Drive	Crankcase In-ter. or Sep.	Piston Material	No. Main Bear.	Oiling System	Oil Cleaner?	Cooling System	Thermostat?	Carburetor	Air Cleaner?	Ignition System	Generator and Starter Make	Clutch—Type and Make	Gear Set—Make	Universal—Type and Make	Type and Make	Gear Ratio	Foot—Type and Location	Hand—Type and Location	4 Wheel Type (=Optional)	Steering Gear—Make	Rear Springs—Type and Length	Type and Make			
Marmen	74	32x6 20	33.8	340	1	He.	Sep.	Al.	3	P.F.	Y	Pu.	N	Sch.	N	Delco.	Delco.	D.Own.	Own.	m-Spi.	3/4	Own.	Var.	E-R	E-R	M*	Own.	O-45	M-B	A-K—Atwater Kent A-L—Auto-Lite A—Adams Al—Alameda Ans—Ansted B&B—Borg & Beck B-L—Brown-Lipe B&B—Borg & Beck Ba—Bass cups Bij—Bijur Bo—Bowen Products Bo-Car Bot—Botcher CAS—Cass Products C&C—Cleveland Cf—Climax Cm—Continental Con—Connecticut Col—Columbia Cpl—Campbell De—DeJon Det—Detroit Dit—Ditweiler Do—Dot Due—Duesenberg Dur—Dursen Dyn—Dyneto Eat—Eaton En—Enots Flt—Flint Ful—Fuller Gem—Gemmet Gm—Gits Hoe—Hoosier Jac—Jacox Joh—Johnson L—Leece-Neville Lay—Layman Lyc—Lycum M&E—Merchant & Evan Mar—Marvel Me—Meyer Mec—Mechanics Machin- Co. Mon—Monson Mun—Muncie N&N—North East Nor—Northway Pet—Peterson R-D—Rock- Driestenberg Ray—Rayfield Roc—Rockford Sa—Salsbury Sal—Salsbury Sch—Schuber Sne—Snead Spe—Special Make Spl—Spicer Spl—Spicer St—Sterling Stm—Stromberg The—Thermoid Thi—Thierner Til—Tillotson Tim—Timken Un—Universal W&G—Warner Gear Wag—Wagner Wat—Ward Wes—Westinghouse W-M—Willing-Morrow Wis—Wisconsin Z—Zenth
McFarlan	SV	32x6 20	33.8	340	1	He.	Sep.	Al.	3	P.F.	Y	Pu.	N	Sch.	N	Delco.	Delco.	D.Own.	Own.	m-Spi.	3/4	Own.	Var.	E-R	E-R	M*	Own.	O-45	M-B	A-K—Atwater Kent A-L—Auto-Lite A—Adams Al—Alameda Ans—Ansted B&B—Borg & Beck B-L—Brown-Lipe B&B—Borg & Beck Ba—Bass cups Bij—Bijur Bo—Bowen Products Bo-Car Bot—Botcher CAS—Cass Products C&C—Cleveland Cf—Climax Cm—Continental Con—Connecticut Col—Columbia Cpl—Campbell De—DeJon Det—Detroit Dit—Ditweiler Do—Dot Due—Duesenberg Dur—Dursen Dyn—Dyneto Eat—Eaton En—Enots Flt—Flint Ful—Fuller Gem—Gemmet Gm—Gits Hoe—Hoosier Jac—Jacox Joh—Johnson L—Leece-Neville Lay—Layman Lyc—Lycum M&E—Merchant & Evan Mar—Marvel Me—Meyer Mec—Mechanics Machin- Co. Mon—Monson Mun—Muncie N&N—North East Nor—Northway Pet—Peterson R-D—Rock- Driestenberg Ray—Rayfield Roc—Rockford Sa—Salsbury Sal—Salsbury Sch—Schuber Sne—Snead Spe—Special Make Spl—Spicer Spl—Spicer St—Sterling Stm—Stromberg The—Thermoid Thi—Thierner Til—Tillotson Tim—Timken Un—Universal W&G—Warner Gear Wag—Wagner Wat—Ward Wes—Westinghouse W-M—Willing-Morrow Wis—Wisconsin Z—Zenth
McFarlan	SV	32x6 20	33.8	340	1	He.	Sep.	Al.	3	P.F.	Y	Pu.	N	Sch.	N	Delco.	Delco.	D.Own.	Own.	m-Spi.	3/4	Own.	Var.	E-R	E-R	M*	Own.	O-45	M-B	A-K—Atwater Kent A-L—Auto-Lite A—Adams Al—Alameda Ans—Ansted B&B—Borg & Beck B-L—Brown-Lipe B&B—Borg & Beck Ba—Bass cups Bij—Bijur Bo—Bowen Products Bo-Car Bot—Botcher CAS—Cass Products C&C—Cleveland Cf—Climax Cm—Continental Con—Connecticut Col—Columbia Cpl—Campbell De—DeJon Det—Detroit Dit—Ditweiler Do—Dot Due—Duesenberg Dur—Dursen Dyn—Dyneto Eat—Eaton En—Enots Flt—Flint Ful—Fuller Gem—Gemmet Gm—Gits Hoe—Hoosier Jac—Jacox Joh—Johnson L—Leece-Neville Lay—Layman Lyc—Lycum M&E—Merchant & Evan Mar—Marvel Me—Meyer Mec—Mechanics Machin- Co. Mon—Monson Mun—Muncie N&N—North East Nor—Northway Pet—Peterson R-D—Rock- Driestenberg Ray—Rayfield Roc—Rockford Sa—Salsbury Sal—Salsbury Sch—Schuber Sne—Snead Spe—Special Make Spl—Spicer Spl—Spicer St—Sterling Stm—Stromberg The—Thermoid Thi—Thierner Til—Tillotson Tim—Timken Un—Universal W&G—Warner Gear Wag—Wagner Wat—Ward Wes—Westinghouse W-M—Willing-Morrow Wis—Wisconsin Z—Zenth
McFarlan	SV	32x6 20	33.8	340	1	He.	Sep.	Al.	3	P.F.	Y	Pu.	N	Sch.	N	Delco.	Delco.	D.Own.	Own.	m-Spi.	3/4	Own.	Var.	E-R	E-R	M*	Own.	O-45	M-B	A-K—Atwater Kent A-L—Auto-Lite A—Adams Al—Alameda Ans—Ansted B&B—Borg & Beck B-L—Brown-Lipe B&B—Borg & Beck Ba—Bass cups Bij—Bijur Bo—Bowen Products Bo-Car Bot—Botcher CAS—Cass Products C&C—Cleveland Cf—Climax Cm—Continental Con—Connecticut Col—Columbia Cpl—Campbell De—DeJon Det—Detroit Dit—Ditweiler Do—Dot Due—Duesenberg Dur—Dursen Dyn—Dyneto Eat—Eaton En—Enots Flt—Flint Ful—Fuller Gem—Gemmet Gm—Gits Hoe—Hoosier Jac—Jacox Joh—Johnson L—Leece-Neville Lay—Layman Lyc—Lycum M&E—Merchant & Evan Mar—Marvel Me—Meyer Mec—Mechanics Machin- Co. Mon—Monson Mun—Muncie N&N—North East Nor—Northway Pet—Peterson R-D—Rock- Driestenberg Ray—Rayfield Roc—Rockford Sa—Salsbury Sal—Salsbury Sch—Schuber Sne—Snead Spe—Special Make Spl—Spicer Spl—Spicer St—Sterling Stm—Stromberg The—Thermoid Thi—Thierner Til—Tillotson Tim—Timken Un—Universal W&G—Warner Gear Wag—Wagner Wat—Ward Wes—Westinghouse W-M—Willing-Morrow Wis—Wisconsin Z—Zenth
McFarlan	SV	32x6 20	33.8	340	1	He.	Sep.	Al.	3	P.F.	Y	Pu.	N	Sch.	N	Delco.	Delco.	D.Own.	Own.	m-Spi.	3/4	Own.	Var.	E-R	E-R	M*	Own.	O-45	M-B	A-K—Atwater Kent A-L—Auto-Lite A—Adams Al—Alameda Ans—Ansted B&B—Borg & Beck B-L—Brown-Lipe B&B—Borg & Beck Ba—Bass cups Bij—Bijur Bo—Bowen Products Bo-Car Bot—Botcher CAS—Cass Products C&C—Cleveland Cf—Climax Cm—Continental Con—Connecticut Col—Columbia Cpl—Campbell De—DeJon Det—Detroit Dit—Ditweiler Do—Dot Due—Duesenberg Dur—Dursen Dyn—Dyneto Eat—Eaton En—Enots Flt—Flint Ful—Fuller Gem—Gemmet Gm—Gits Hoe—Hoosier Jac—Jacox Joh—Johnson L—Leece-Neville Lay—Layman Lyc—Lycum M&E—Merchant & Evan Mar—Marvel Me—Meyer Mec—Mechanics Machin- Co. Mon—Monson Mun—Muncie N&N—North East Nor—Northway Pet—Peterson R-D—Rock- Driestenberg Ray—Rayfield Roc—Rockford Sa—Salsbury Sal—Salsbury Sch—Schuber Sne—Snead Spe—Special Make Spl—Spicer Spl—Spicer St—Sterling Stm—Stromberg The—Thermoid Thi—Thierner Til—Tillotson Tim—Timken Un—Universal W&G—Warner Gear Wag—Wagner Wat—Ward Wes—Westinghouse W-M—Willing-Morrow Wis—Wisconsin Z—Zenth
McFarlan	SV	32x6 20	33.8	340	1	He.	Sep.	Al.	3	P.F.	Y	Pu.	N	Sch.	N	Delco.	Delco.	D.Own.	Own.	m-Spi.	3/4	Own.	Var.	E-R	E-R	M*	Own.	O-45	M-B	A-K—Atwater Kent A-L—Auto-Lite A—Adams Al—Alameda Ans—Ansted B&B—Borg & Beck B-L—Brown-Lipe B&B—Borg & Beck Ba—Bass cups Bij—Bijur Bo—Bowen Products Bo-Car Bot—Botcher CAS—Cass Products C&C—Cleveland Cf—Climax Cm—Continental Con—Connecticut Col—Columbia Cpl—Campbell De—DeJon Det—Detroit Dit—Ditweiler Do—Dot Due—Duesenberg Dur—Dursen Dyn—Dyneto Eat—Eaton En—Enots Flt—Flint Ful—Fuller Gem—Gemmet Gm—Gits Hoe—Hoosier Jac—Jacox Joh—Johnson L—Leece-Neville Lay—Layman Lyc—Lycum M&E—Merchant & Evan Mar—Marvel Me—Meyer Mec—Mechanics Machin- Co. Mon—Monson Mun—Muncie N&N—North East Nor—Northway Pet—Peterson R-D—Rock- Driestenberg Ray—Rayfield Roc—Rockford Sa—Salsbury Sal—Salsbury Sch—Schuber Sne—Snead Spe—Special Make Spl—Spicer Spl—Spicer St—Sterling Stm—Stromberg The—Thermoid Thi—Thierner Til—Tillotson Tim—Timken Un—Universal W&G—Warner Gear Wag—Wagner Wat—Ward Wes—Westinghouse W-M—Willing-Morrow Wis—Wisconsin Z—Zenth
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McFarlan	SV	32x6 20	33.8	340	1	He.	Sep.	Al.	3	P.F.	Y	Pu.	N	Sch.	N	Delco.	Delco.	D.Own.	Own.	m-Spi.	3/4	Own.	Var.	E-R	E-R	M*	Own.	O-45	M-B	A-K—Atwater Kent A-L—Auto-Lite A—Adams Al—Alameda Ans—Ansted B&B—Borg & Beck B-L—Brown-Lipe B&B—Borg & Beck Ba—Bass cups Bij—Bijur Bo—Bowen Products Bo-Car Bot—Botcher CAS—Cass Products C&C—Cleveland Cf—Climax Cm—Continental Con—Connecticut Col—Columbia Cpl—Campbell De—DeJon Det—Detroit Dit—Ditweiler Do—Dot Due—Duesenberg Dur—Dursen Dyn—Dyneto Eat—Eaton En—Enots Flt—Flint Ful—Fuller Gem—Gemmet Gm—Gits Hoe—Hoosier Jac—Jacox Joh—Johnson L—Leece-Neville Lay—Layman Lyc—Lycum M&E—Merchant & Evan Mar—Marvel Me—Meyer Mec—Mechanics Machin- Co. Mon—Monson Mun—Muncie N&N—North East Nor—Northway Pet—Peterson R-D—Rock- Driestenberg Ray—Rayfield Roc—Rockford Sa—Salsbury Sal—Salsbury Sch—Schuber Sne—Snead Spe—Special Make Spl—Spicer Spl—Spicer St—Sterling Stm—Stromberg The—Thermoid Thi—Thierner Til—Tillotson Tim—Timken Un—Universal W&G—Warner Gear Wag—Wagner Wat—Ward Wes—Westinghouse W-M—Willing-Morrow Wis—Wisconsin Z—Zenth
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KEY TO SYMBOLS
 —At extra cost
 B—Balloons at extra cost
 F—Semi-floating
 Q—Three-quarter floating
 A—Air
 Al—Aluminum
 B—Semi-steel
 B-F—Both internal and external
 Ch—Chain

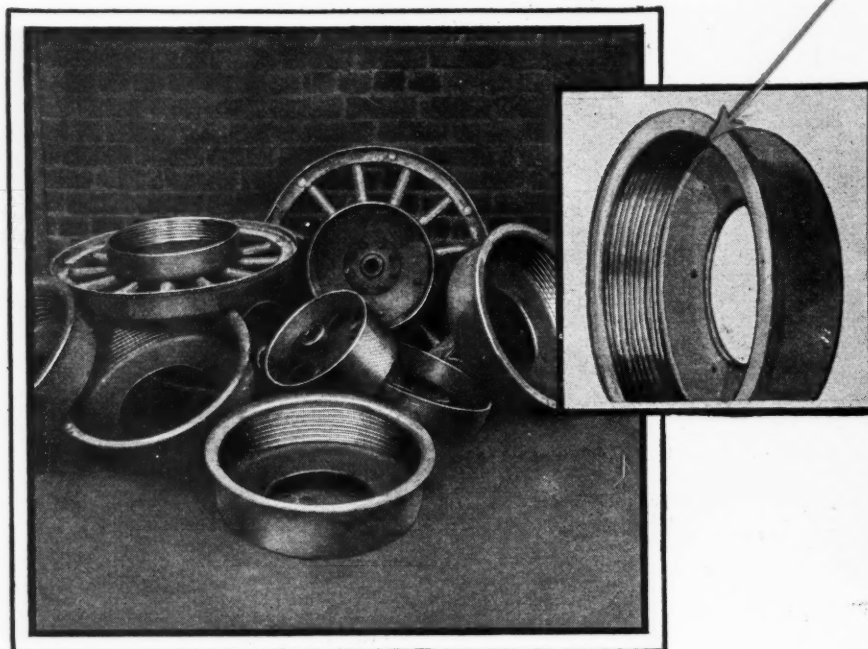


A NEW YEAR'S TIP

For a prosperous New Year and permanent success in the automobile business, sell **OLDSMOBILE**

Ch—Chain
R-P—Both internal and external four wheels
F—Fabric
F-Filter
F¹—Full floating
K—Cone
I-R—Internal rear wheels
J—Three-quarter elliptic
P—Pressure gun
Oe—Oil cups
Q—Quarter elliptic
R—Rectifier
Sep—Separate
X—Sleeve valve
Yes
Z—Balance on closed models
Zer-Zent
Zer—Zenith
Zer—Zeiss
Yale—Yaconsin
W-M—Willis-Morrow
We—Washington

PREVENT BRAKE DRUM SCORING



Actual photograph of scored drums, junked by the cutting action of the ordinary brake lining. HYCOE does not score brake drums because of its non-abrasive nature.

USE

Hycoe
SETS A NEW BRAKING STANDARD
BRAKE LINING

for Replacement Economy
and Satisfaction

Actual photograph of brake drum after 27 months of hard service with HYCOE. This drum is made of soft mild steel.

THE MANHATTAN RUBBER MFG. COMPANY

Executive Offices and Factories: Passaic, N. J.

Branches:

Chicago
Detroit

New York
Baltimore

Birmingham
Boston

Cleveland
Los Angeles

Minneapolis
New Orleans

Philadelphia
Pittsburgh

Salt Lake City
St. Louis



Chief of the Sixes

To the Automobile Dealers of America

OUR next announcement will reveal the name and other vital facts concerning the new General Motors Six—an entirely new automobile of tremendously broad appeal.

Subsequently the car itself will be displayed at the principal automobile shows.

This newest member of a famous family will be the fruit of the resources, engineering skill and manufacturing experience gained by General Motors in more than seventeen years of leadership.

It will combine elements of appearance, performance, and engineering design which will win for it immediate public acceptance. Its price will be such as to have a nation-wide appeal.

It will be built by Oakland and distributed as companion to the present Oakland Six under a double franchise that promises to become one of the most profitable in the industry.

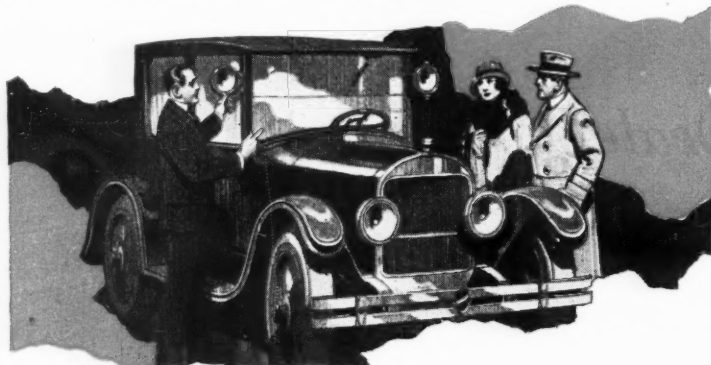
Every automobile dealer in America—regardless of size, location or present affiliation—is invited to write at once for complete details. Address Oakland Motor Car Company, Pontiac, Mich.

STEWART-WARNER

1926 Campaign for Better Accessories-

THIS is going to be a great year for every dealer standardizing on the Stewart-Warner Accessory Family.

The time has come to give careful thought to the quality of the accessories offered to your customers.



You hold your customer's satisfaction and good-will of far more value than any special discounts on products of doubtful character.

The car you sell has been steadily improved. The car manufacturer has exerted every effort toward obtaining better material and better construction. In keeping with this we urge the use of **BETTER ACCESSORIES.**

To install "gim-cracks"—unknown brands—or brands in which the car owner takes no pride—is to be-little your car product—and gain nothing but adverse criticism.

So, we know that the dealer will join with us in a Campaign for Better Accessories, right at this time when accessories have attained the position of essentials.



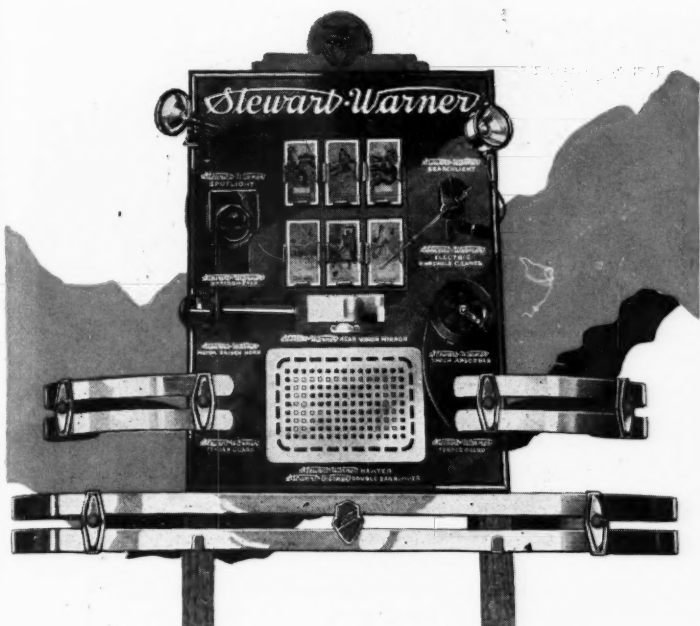
Twelve million people are today using Stewart-Warner Accessories, and this with our greatly increased appropriation for 1926 National Publicity will make selling easy for the dealer—and add laurels to the car he sells.

Our 1926 Message

We are going to tell the public that **YOU** have his best interests at heart. That **YOU** are the logical **ONE** to sell him his accessories. That he can buy his entire equipment of "better accessories" under one name—"Stewart-Warner." In this connection we do not claim to make the **ONLY** "better accessories," but we **DO CLAIM TO MAKE THE ONLY COMPLETE LINE OF BETTER ACCESSORIES.**

A car fully equipped with Stewart-Warner Accessories creates attention and can be sold on the assurance of 100% protection and satisfaction. Right now—at the beginning of the year—at inventory time—is an excellent time to take stock of your accessory business.

Aside from the superior selling advantages in the Stewart-Warner Line—you have the valuable advantage of Stewart-Warner Distribution Service, through 62 Service Stations in leading centers in



the United States and Canada and 34 in foreign lands. We have no jobbers or other distributors. We control our entire distribution. This enables the dealer to do business with a comparatively small stock—getting new stock as needed in a few hours time.

SEE WHAT THIS DOES:

It reduces your stock room space.

It reduces the cost of stock-keeping records.

It requires a smaller investment.

It gives you better control of finances.

It eliminates "dead ones."

It prevents loss on "orphans."

It saves "writing-off" for depreciation.

It insures a fresh stock at all times.

It perfects your organization.

It gives you multiplied turn-over—ever increasing percentage of profit on the initial investment.

Stewart-Warner Accessories

TWELVE MILLION PEOPLE ARE TODAY USING STEWART-WARNER PRODUCTS

Could you ask for more?

You can join with us in the 1926 Campaign for Better Accessories and reap the harvest that is already assured because of the record heights to which Stewart-Warner sales mounted in 1925.

Compare your inventory right now with the Stewart-Warner Line and decide which you would rather have.

We'll work with you and for you. We are organized to do so and seek the opportunity.

Yours for Better Accessories,

STEWART-WARNER SPEEDOMETER CORPORATION

CHICAGO U. S. A.



Stewart-Warner Accessory Family

Shock Absorbers
Bumpers
Rear Fender Guards
Spotlights
Electric Horn
Electric Windshield
Cleaner
Rear Vision Mirrors
Speedometers
Heaters
Vacuum Tank

Stewart-Warner Matched-Unit
Radio

INSTRUMENTS - TUBES
REPRODUCERS AND
ACCESSORIES



What AC Means to the Dealer

New AC Spark Plugs



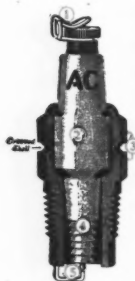
A new design, new alloy for sparking points, new electrically fused Kyanite insulator core and a new glaze.

AC Carbon-proof Plugs are also made in all sizes.

The demand for AC Spark Plugs is assured through their use as factory equipment on the following cars:

Ajax	Davis	Nash
Apperson	Dodge	Oakland
Buick	Brothers	Oldsmobile
Cadillac	Durant	Paige
Case	Essex	Star
Chandler	Flint	Velie
Chevrolet	Hudson	Westcott
Chrysler	Hupmobile	Wills Seate
Cleveland	Kissel	Claire
	Marmion	

New AC 1075 for Fords



The special features of the AC 1075 make it the most desirable plug for Fords. Dealers are building a big and profitable business by emphasizing these features in making sales:

- 1 Spring Terminal Clip
- 2 Heavy Body Porcelain
- 3 Hexagon of extra length permits easy and positive application of spark plug wrench
- 4 High Temperature Fins—Patented carbon-proof Porcelain
- 5 Drip electrode forms natural Oil Drain

Made in both one and two-piece design.

DEALERS
who carry AC
products can
build a profit-
able business.

The demand is
assured because
of their use as
car equipment.

They are backed
by strong adver-
tising.

AC Spark Plug Company, FLINT, Michigan

Makers of AC Spark Plugs—AC Speedometers

—AC Air Cleaners

AC-SPHINX
Birmingham
ENGLAND

AC-OLEO
Levallois-Perret
FRANCE

AC Speedometers



The Model for Fords

There is proof of the quality of AC Speedometers in the fact that they are used as original factory equipment on Buick, Cadillac, Chandler, Chevrolet, Chrysler, Gray, Oakland, Oldsmobile, Peerless and G. M. C. trucks.

The AC Speedometer for Fords is of the same quality as furnished the above manufacturers for their original factory equipment.

The AC Direct Drive does away with the troublesome swivel joint and insures continuously satisfactory service.

Packed complete with all attachments.

AC Air Cleaners



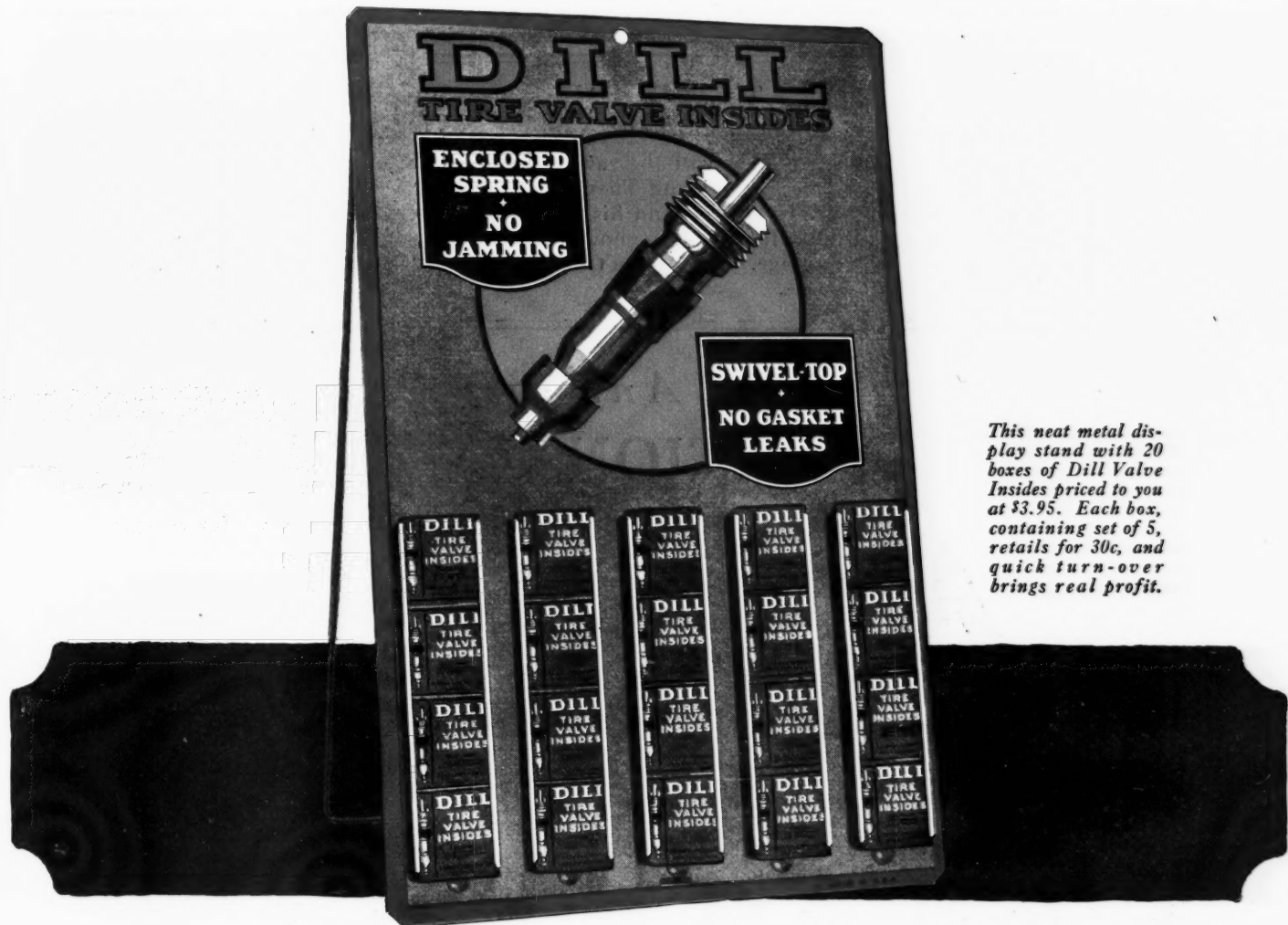
The AC Air Cleaner prevents dust from entering the motor through the air intake of the carburetor.

Dust is the same as an abrasive compound and causes excessive wear on all the motor's moving parts.

AC Air Cleaners are original factory equipment on the 1926 models of Nash, Buick and Oakland.

Installation is easy as it connects directly to the carburetor. Once installed it requires no attention as there are no moving parts to get out of order. Packed complete with all attachments.

Models are now ready for Chevrolet, Chrysler Four, Dodge Bros., Ford, Maxwell, Oldsmobile, Star, Studebaker, as well as the 1925 and earlier models of Buick, Nash and Oakland.



Valve insides sell themselves from this attractive display

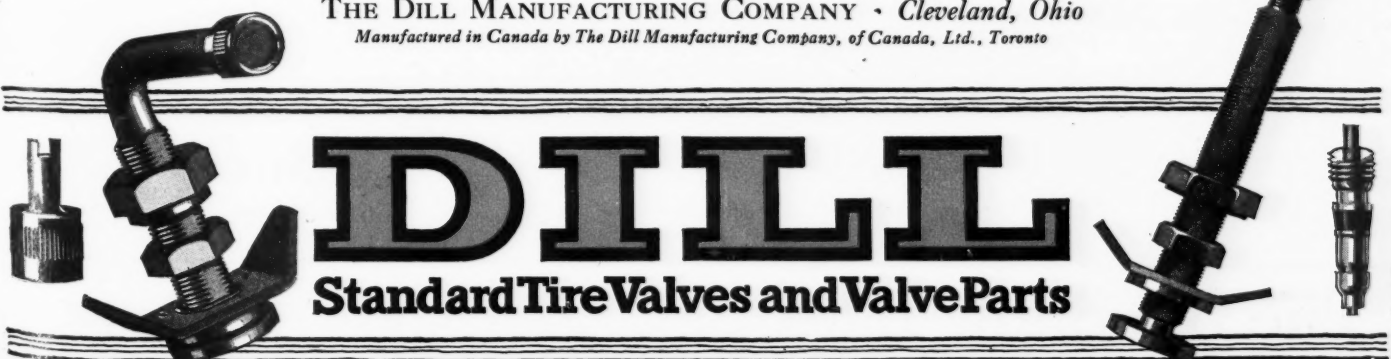
SET this display stand on your counter and watch how the little boxes of Dill Valve Insides are snapped up! Balloon tire users, especially, are quick to buy them. Every pound of pressure in their tires is important, and they know that there is no danger of leakage through Dill Valve Insides.

A sturdy metal barrel protects the frail

valve stem and spring. No chance of bending or twisting out of place. Every part is made and assembled with the finest accuracy to do the job 100%—and they never fail!

Your jobber will supply you with this display stand filled with Dill Valve Insides. Order from him today, or write direct to us.

THE DILL MANUFACTURING COMPANY • Cleveland, Ohio
Manufactured in Canada by The Dill Manufacturing Company, of Canada, Ltd., Toronto



TO THE TRADE

WRITE TODAY for tickets for the TRADE SESSIONS of the National Automobile Shows. They will be available for admission from 10 A. M. to 1 P. M. on Monday and Tuesday at each show. The head of every concern in the industry, and his principal representatives, are entitled to admission. If you write now your show tickets will cost you two cents—for postage. If you don't, it may cost you dollars worth of time standing in line.

**26th Annual
NATIONAL**

Auto Shows

Auspices of National Automobile Chamber of Commerce, Inc.

AT NEW YORK

GRAND CENTRAL PALACE
JANUARY 9th to 16th

AT CHICAGO

COLISEUM
JANUARY 30th to FEBRUARY 6th . . .

S. A. MILES, Manager
366 Madison Ave., New York

The Big Show Back in Grand Central Palace

An automobile with the body five inches nearer the ground than in any existing model yet maintaining ample road clearance and head room



"IN the new car, the center of gravity has been materially lowered, and a seating position is gained by a chassis design that drops the body a full five inches nearer the ground, while maintaining ample road clearance and head room."

A statement regarding a truly remarkable new car by the publishers of this paper

To the Automobile Trade:

THE publishers and the technical experts of this publication have been given an advance private showing and demonstration of a very notable new car, details of which will appear in immediately following issues.

For trade reasons, the name of this car and the identity of its makers will not be divulged until just before the New York Show.

THE SATURDAY EVENING POST

January 2, 1926

A statement by the owners of the Stutz Motor Car Co.

Messrs. Charles M. Schwab, Eugene V. R. Thayer, Carl J. Schmidlapp are now the largest stockholders in the Stutz Motor Car Company of America, Inc.

Not only have they invested a large amount of their own money in this company, but they have contributed much of their time to the formation of its present organization.

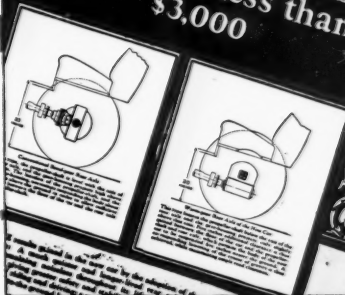
It is their intention to maintain both their monetary and their personal interests therein.

With the men associated with them, it will be their earnest endeavor to make the Stutz Motor Car Company one of the leading automobile companies of America in stability and progressiveness.

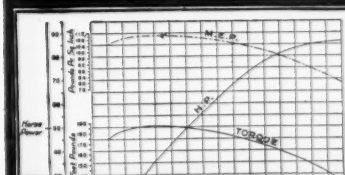
In the next issue of this publication there will appear a presentation of a remarkable new automobile which we are sincerely convinced will set new standards in motor car engineering and performance.

F. E. MORGENTHAU, President
STUTZ MOTOR CAR COMPANY
OF AMERICA, INC.
Indianapolis

An automobile with a worm-drive rear axle selling for less than \$3,000



A dependable automobile engine under 300 cu. inches showing this power curve



The NEW STUTZ

"When an organization of vision and ambition engages year after year in the production of motor cars, it develops certain ideals, definite standards of perfection; it conceives its 'dream car.'"

"But the ideal of practical automobile technicians is never a merely theoretical conception, for it is born of the hard school of experience and close observation of the requirements of the public. The ideal car embodies all the virtues that experience has shown desirable, and eliminates all the disadvantages that observation has taught to be detrimental.

"Some ideal cars remain but dreams, never reaching material being because of production problems or financial limitations. A few pass from the dream stage into reality and become pioneers of new eras.

"The New Stutz is an ideal car—the realization of notably ambitious aims. In its design has been enlisted the skill of leading engineers of America and Europe, who have adopted tried and proven ways to accomplish the desired ends. It is being built with little restriction on eventual production costs, ample capital being available, with no interference from hampering traditions.

"We, who have built the car for you, offer the result of our labors firm in the conviction that we are rendering a distinct contribution to motor car engineering."

F. E. Morgenthau

President, The Stutz Motor Car Company

MOTOR

"The motor of the New Stutz will, I confidently expect, be recognized by the automotive engineering profession as a decided advance toward the common goal of greater simplicity, maximum efficiency and elimination of vibration.

"In evolving this motor, I have had associated with me C. E. Greuter, a pioneer designer of overhead-valve engines; Paul Bastien, a former chief engineer of the Societe Anonyme Auto-Metallurgique, Brussels; and William Guy Wall, one of America's leading engineers.

"While in some ways, this automobile appears to be a radical departure from earlier practice, it utilizes only tried and sound principles. It is the new application and combination of these principles which result in such a remarkable automobile."

Chas. E. Crawford

Chief Engineer, Stutz Motor Car Company

REAR AXLE and BRAKES

"The worm-drive rear axle incorporated in the New Stutz is intrinsically as standard and as proven a type as the more familiar bevel-gear drive.

"This company has equipped thousands of modern, high-speed and long-distance motor buses with worm-drive rear axles of essentially the same type. Even under this strenuous service, worm-drive axles that have already gone three hundred thousand miles and more are good for several hundred thousand additional miles—and with no lessening of their quietness or efficiency. On passenger cars, the worm-drive should be good for at least a half-million miles, or longer than any car is likely to remain in service.

"The hydrostatic brakes with which the New Stutz is fitted have been thoroughly demonstrated in service. Their principle is recognized as sound hydro-mechanical engineering.

"The design of this brake gives practically 100% contact of the brake-shoes on the drums—with equal pressure applied to all four wheels. The hydrostatic system is a closed one, and being hermetically sealed, is insured against leakage and evaporation."

Geo. H. Haden

Chairman of the Board, Timkin-Detroit Axle Co.

BODIES

"In an international experience extending from the inception of the automobile, I never before have had presented such an opportunity for legitimately 'hanging a car on the ground.'"

"The chassis construction of the New Stutz has permitted us to approach very closely to the ideal in motor car proportions. The result is a car of very distinctive appearance, yet free from any suggestion of freakishness, whose lines and contour are exceedingly smart and, by their directness, suggestive of smooth, straightforward speed.

"No sacrifice of either legroom or headroom is made; on the other hand, the low center of gravity must greatly add to the comfort and safety of the passengers."

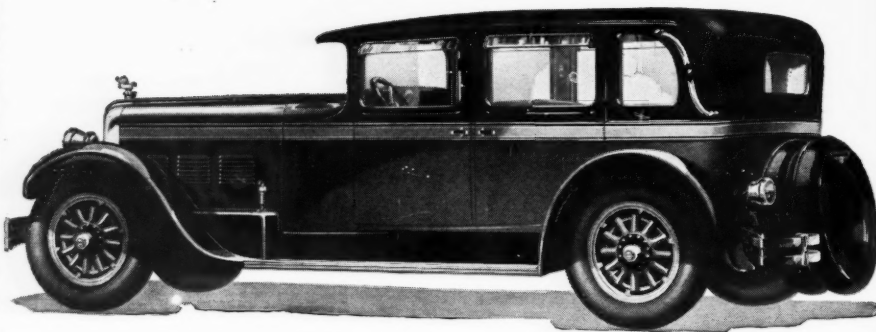
Wm. Brewster

Brewster & Company, New York

see next page

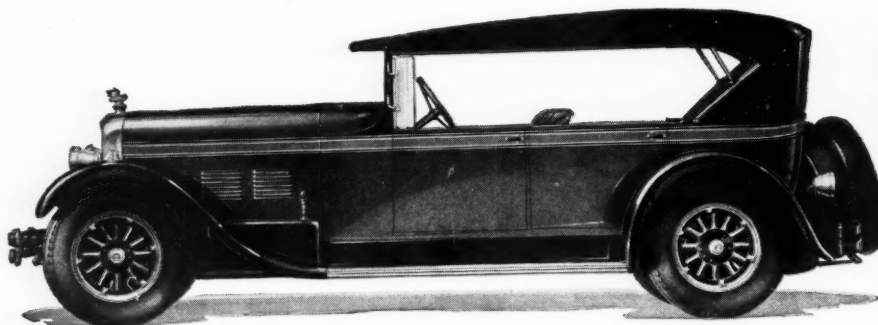
The NEW STUTZ

vertical eight



The Brougham

A five-passenger closed car of the same general design as the sedan, except that the rear quarter windows are D-shaped instead of rectangular, and rear quarter is leather-trimmed and embellished with Victoria irons. Hubbard Ventilating Eaves on doors.

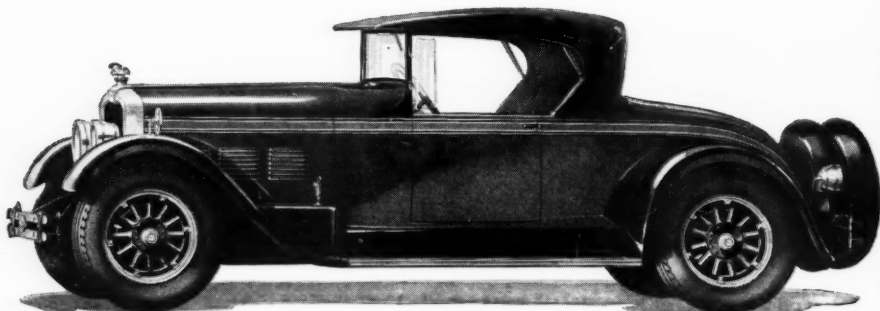


The four-passenger Speedster

A roomy, four-passenger Speedster with one-man folding top. A tonneau storm-apron, reaching from the back of the front seat to the back of the rear seat is provided.

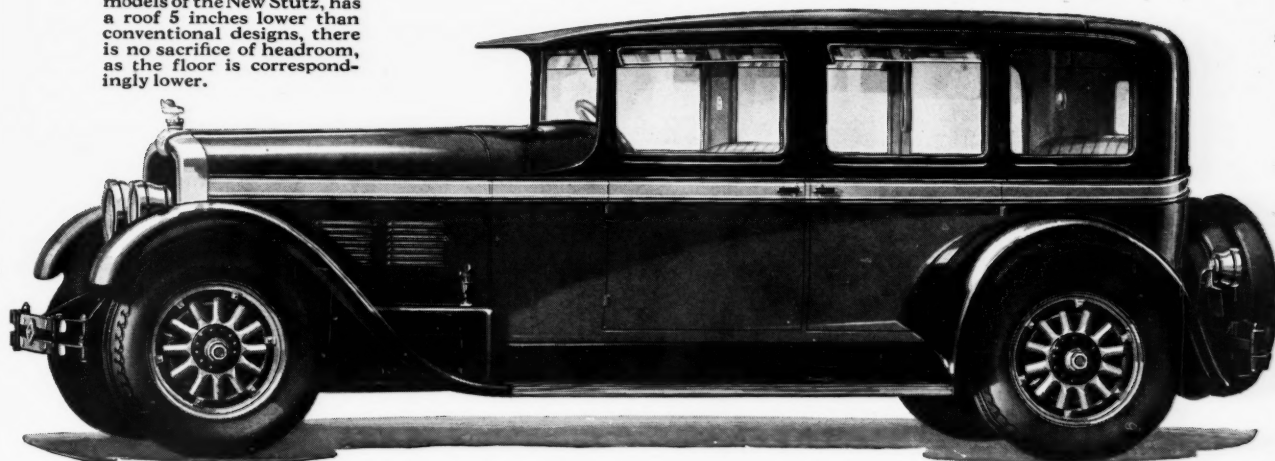
The two-passenger Speedster

An open car with rumble seat in rear deck; a door in curb side of the rear deck permits using rear compartment for golf clubs, etc., without opening up the rumble seat. It has a detachable folding top.



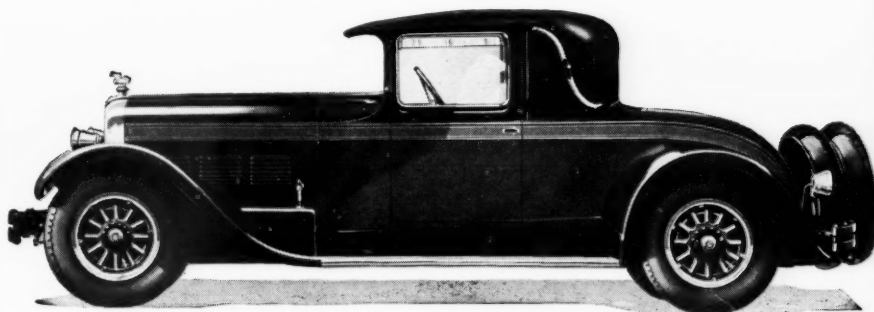
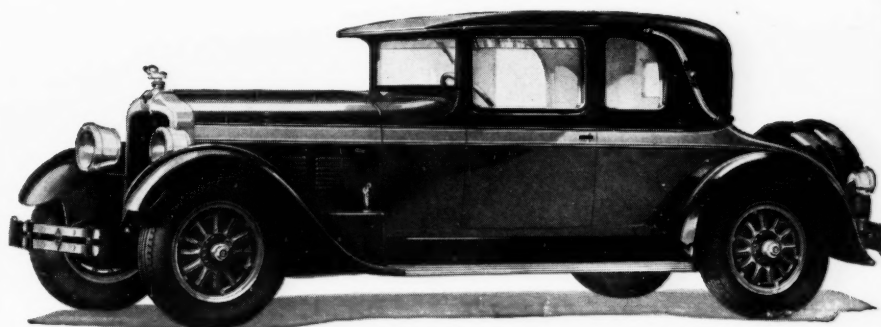
The five-passenger Sedan

A genuine sedan (not a coach) with full windows all around. Hubbard Ventilating Eaves on doors. Although this, like all other closed models of the New Stutz, has a roof 5 inches lower than conventional designs, there is no sacrifice of headroom, as the floor is correspondingly lower.



The Victoria Coupe

A four-passenger staggered-seat closed car of customary coupe arrangement, but with leather-trimmed, Victoria-ironed rear quarter. It has a rear deck with door, a golf-club compartment and a glove-box. Hubbard Ventilating Eaves on doors.



The two-passenger Coupe

A single-seat-inside closed car with rumble seat in rear deck. Door in curb side of rear deck to admit golf clubs, etc. Leather-trimmed, Victoria-ironed rear quarter. Drop glass in rear of body. Parcel compartment back of front seat.

see next page

The first showing of a new and advanced type of automobile at the NEW YORK SHOW

THE NEW STUTZ is "the new car" that you have been reading about in the preceding issues of this publication. It is more than a new model, more than the usual yearly refinement or dressing-up with minor improvements.

It is a car of a new type, basically and fundamentally different from all other cars of today. Yet no single feature of The NEW STUTZ is experimental or untried. The car simply combines proven features never before brought together in one automobile.

Read the condensed summary of features below:

VERTICAL EIGHT MOTOR—This motor shows a performance unparalleled by any other stock motor under 290 cu. in. piston displacement. The motor develops over 90 H.P. A speed of over 75 miles per hour is available when desired; likewise, acceleration from 10 to 50 miles per hour in less than 15 seconds. The camshaft, actuated by an exclusive form of automatic silent-drive, operates directly on the tappets of overhead valves. These function without either rocker-arms, push-rods, rollers, or other noise-producers. The crankshaft is very large, heavy, rigid; it is inherently balanced. It has nine bearings with a total bearing-surface of 120.5 sq. in., exceeding that of any other motor of its capacity. Vibration is non-existent. Fan mechanically actuated; no belt required.

WORM-DRIVE REAR AXLE—The adoption of this costly type of rear axle, in combination with a lowered center of gravity, represents its first appearance in any American passenger car, regardless of price. Yet, it is standard in the more expensive foreign chassis, and has been thoroughly proved by long use on thousands of motor vehicles.

This type of axle is incomparably quiet at all speeds, and remains noiseless after hundreds of thousands of miles. In fact, the worm-drive improves rather than deteriorates with use. The worm and gear are guaranteed by us for two years.

NON-LEAKING, HYDROSTATIC BRAKES—These are four-wheel brakes of an entirely new design. There is nothing on them to adjust; they are inherently equalized. There are no working parts to get out of order. Each brake is divided into six shoes, which are uniformly actuated by an expanding circular tube, giving equalized braking pressure at every point on every wheel. Leakage is impossible, as there are no cylinders or pistons. The entire hydrostatic system is of continuous tubular construction, hermetically sealed. The lining will last several times as long as in brakes of conventional design, and the shoes can be readily replaced.

CHASSIS LUBRICATION SYSTEM—All working parts of the chassis are lubricated by an entirely new self-lubricating system, non-clogging, self-cleansing, troubleless and positive. Oil is fed to each moving part by means of local magazines, which contain enough oil for three months' supply, mechanically refilled directly from the motor when needed.

OIL RECTIFIER—A triple-duty rectifier keeps the crankcase oil at its original purity and consistency, eliminating all foreign matter, gasoline and water.

IGNITION—The Delco dual ignition operates two spark plugs in each cylinder from opposite points. The firing of the gasoline charge from two points lessens the actual burning time, increases the mixture turbulence and thereby delivers a greater explosive force against the piston-head. Knocking is eliminated, acceleration is improved, greater speeds are attainable, and longer and harder "pulls" may be negotiated.

FRAME—Most rigid frame on any car, with integral steel running boards (actually, side bumpers). Seven cross-members; double drop, torsion-resisting construction.

LIGHTS—Twin-beam reflector headlights; steering column control. Combination tail, stop and backing light.

FINISH—Lacquer, three tones. Polished to a high lustre. Available in a number of attractive color combinations.

UPHOLSTERY—Rich and luxurious, employing fine, high-grade fabrics and genuine leathers of distinctive beauty.

LOCATION OF CONTROLS—Emergency brake and gear shift lever within a hand-span of the steering wheel. No obstruction to passage between controls and front seat.

INSTRUMENT BOARD—Speedometer, eight-day clock, ammeter, oil gauge, gasoline gauge and water-temperature indicator are all under one glass plate, indirectly illuminated. Board also carries ignition control, carburetor control and a combination cigar-and-pipe lighter, inspection and spot light.

BODIES—Six models. Designed and constructed under the supervision of Brewster of New York.

All models are equipped with bumpers, front and rear, Watson Stabilators and full-balloon cord tires. Hubbard Ventilating Eaves on all closed-body doors.

To the Automobile Trade:

Dealers who are interested are invited to write to The Stutz Motor Car Company for fuller details and to inspect The NEW STUTZ at the Automobile Shows.

STUTZ MOTOR CAR CO.
of America, Inc.
INDIANAPOLIS

see preceding page



Be a noise killer

IT is a sure way to please all of your trade. If you make the engine run more quietly, even the least-knowing motorist appreciates that you have improved his car.

You know that the clash of metal-on-metal in the timing assembly is responsible for much of the irritating motor noise. You can put an end to this noise by installing a

Textolite

Silent Cam Shaft Timing Gear



Like many other General Electric products, Textolite Gears were developed in the Research Laboratories. Here scientists are working continually that men may have better materials with which to work.

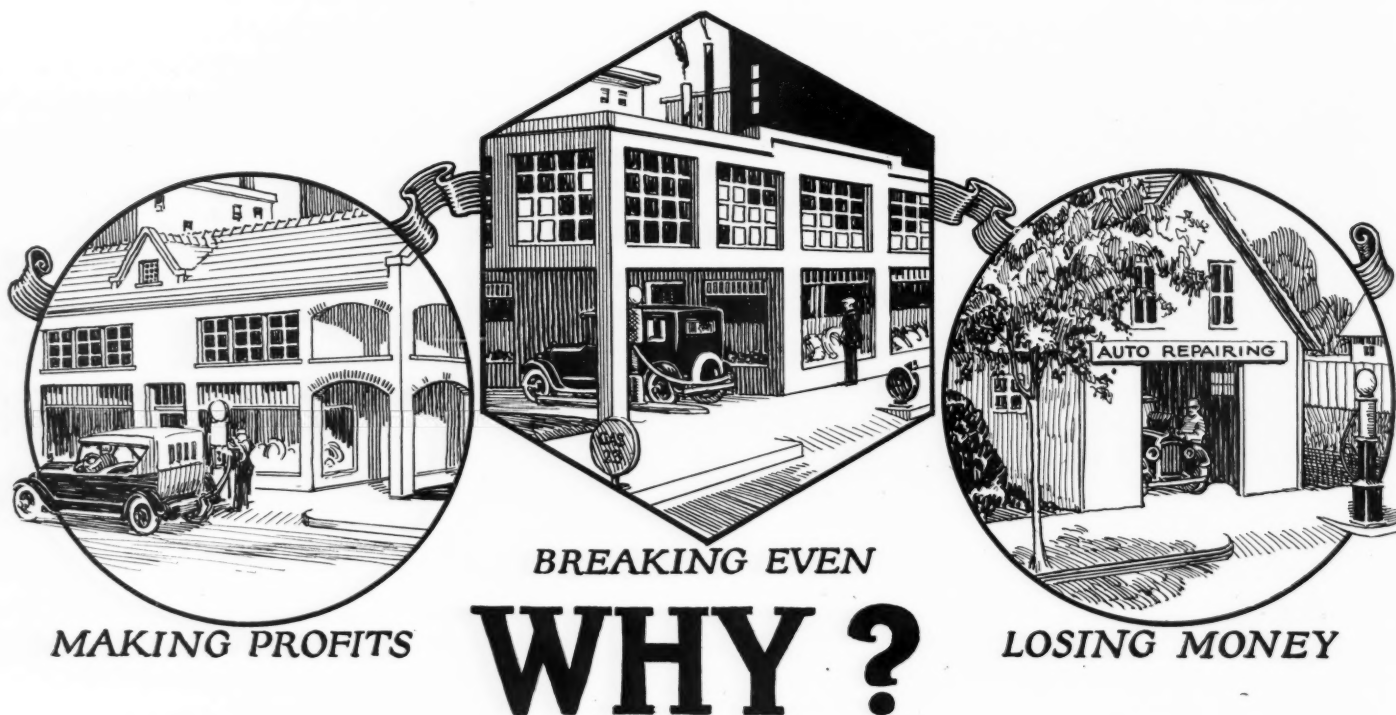
Textolite Cam Shaft Timing Gears have a flexible web. They are die-formed. They will absorb the shocks of 100,000 miles of severest service. They are oil-proof, heat-proof and tougher than cast iron.

Get the complete story and name of your nearest distributor from

JOHN C. HOOFF & COMPANY
157 West Illinois Street, Chicago, Ill.

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN ALL LARGE CITIES



The Difference Comes in Knowing How

There are three kinds of automotive dealers—those who are making money, those who are not making money, and those who are actually running their business at a loss.

Only one kind survives—and that is the first of the three.

Profit makers know how. They take advantage of every opportunity to learn. Reading right, is perhaps their most productive teacher. It shows them dozens of ways to success.

Every week MOTOR AGE brings to its subscribers ways and means of making good. Every week there is something of money value in it for you.

MOTOR AGE

5 So. Wabash Ave.

Chicago, Ill.

Rickenbacker

A • CAR • WORTHY • OF • ITS • NAME

Built Up To a Standard—Not Down To a Price

You Will Be Interested

Rickenbacker policies—
Rickenbacker types—
Rickenbacker values for
the coming year represent
a distinct departure
from the prevailing trend
which may be expressed
in the phrase "Cut
quality—then cut
price."

With characteristic daring
and initiative this dynamic
concern which has taken
the leadership in so many
innovations, now again
shows the way.

You will be intensely
interested in the Rickenbacker
line for the coming year.

They comprise all standard
and at least two strikingly
original types.

All will be exhibited at the
National Shows—and in
the spacious show rooms
of our metropolitan distributors.

See the new Rickenbackers.

Ask about our sales plan for
the future—you will be
surprised and pleased
with both.

Rickenbacker Motor Company
Detroit, Michigan

Famous "Six" Prices

7 Pass. Phaeton	- - - -	\$1795
5 Pass. Phaeton	- - - -	1750
4 Pass. Roadster	- - - -	1795
5 Pass. Coupe Sedan	- - - -	1695
4 Pass. Coupe Roadster	- - - -	1920
5 Pass. Brougham	- - - -	1895
5 Pass. Sedan	- - - -	2095
7 Pass. Sedan	- - - -	2195
4 Pass. De Luxe Coupe	- - - -	1995



f.o.b. Detroit—plus war tax

Vertical "Eight" Prices

7 Pass. Phaeton	- - - -	\$2195
5 Pass. Phaeton	- - - -	2150
4 Pass. Roadster	- - - -	2195
5 Pass. Coupe Sedan	- - - -	2095
4 Pass. Coupe Roadster	- - - -	2320
5 Pass. Brougham	- - - -	2295
5 Pass. Sedan	- - - -	2495
7 Pass. Sedan	- - - -	2595
4 Pass. De Luxe Coupe	- - - -	2395

THE HEADLIGHT ADJUSTING STATION

Vol. I. No. 4.

PUBLISHED BY THE AMERICAN FLATLITE CO.



**Just Read What One of
Oregon's Leading Official
Headlight Adjusters Says
About Flatlite—**

*Yes. It's the young lady
in the picture.*

We wrote her on November 23rd, and enclosed a copy of our booklet "Motor Vehicle Headlighting."

Her answer follows:

The American Flatlite Co.,
Reading Road at Dandridge St.,
Cincinnati, Ohio.

Gentlemen:

We are in receipt of your letter and the forms mailed to us November 23rd. The forms are very helpful, especially the pamphlet "Motor Vehicle Headlighting."

Our headlight adjusting station proved to be more satisfactory than we hoped when we installed it, both from the financial standpoint and as a drawing card for new cus-

tomers. We were surprised at the number of people, not only from our own district, but from all parts of town, who came to have their lights adjusted, who had never been in before, and we know that a good many of them will come back when they need other service.

We have kept a list of all the cars we adjusted and the name and address of the owners, thereby building up a very good mailing list which we can use to advantage in advertising our shop and other lines.

It is always a pleasure to me to work with Flatlite Reflectors, because I am always sure of the satisfaction of the best light it is possible to get.

Thanking you for your interest, I am

Very truly yours,

Mrs. EILEEN GANTENBEIN.

LONG & SILVA GARAGE
East Eighth and Hawthorn Streets
Portland, Oregon.

Every light adjusting station in the country should have a copy of our free 28-page book on Motor Vehicle Headlighting.

Every garage and service station should consider this new and profitable business.

And the best and quickest way to learn all about how to conduct a light adjusting station anywhere, is to mail the coupon below. Ask us anything you want to know. We have the answer based on the experience of thousands of successful stations located in every state.

Cut out and mail the coupon now.

The American Flatlite Co.

Reading Road at Dandridge Street
Cincinnati, Ohio

flatlite

THE AMERICAN FLATLITE CO.

Reading Road at Dandridge Street
Cincinnati, Ohio

Dept. A

Gentlemen:

Please send me without charge or obligation booklets and literature on headlight adjusting station equipment.

NAME _____

ADDRESS _____

☐ Check here if you want copy of "Motor Vehicle Headlighting." A 28-page text book on headlighting. No charge.

***Chevrolet's
Greatest Year
-a half
million
cars in
1925***

Never before has any manufacturer of gear-shift automobiles even approached Chevrolet's total production this year of over a half million cars.

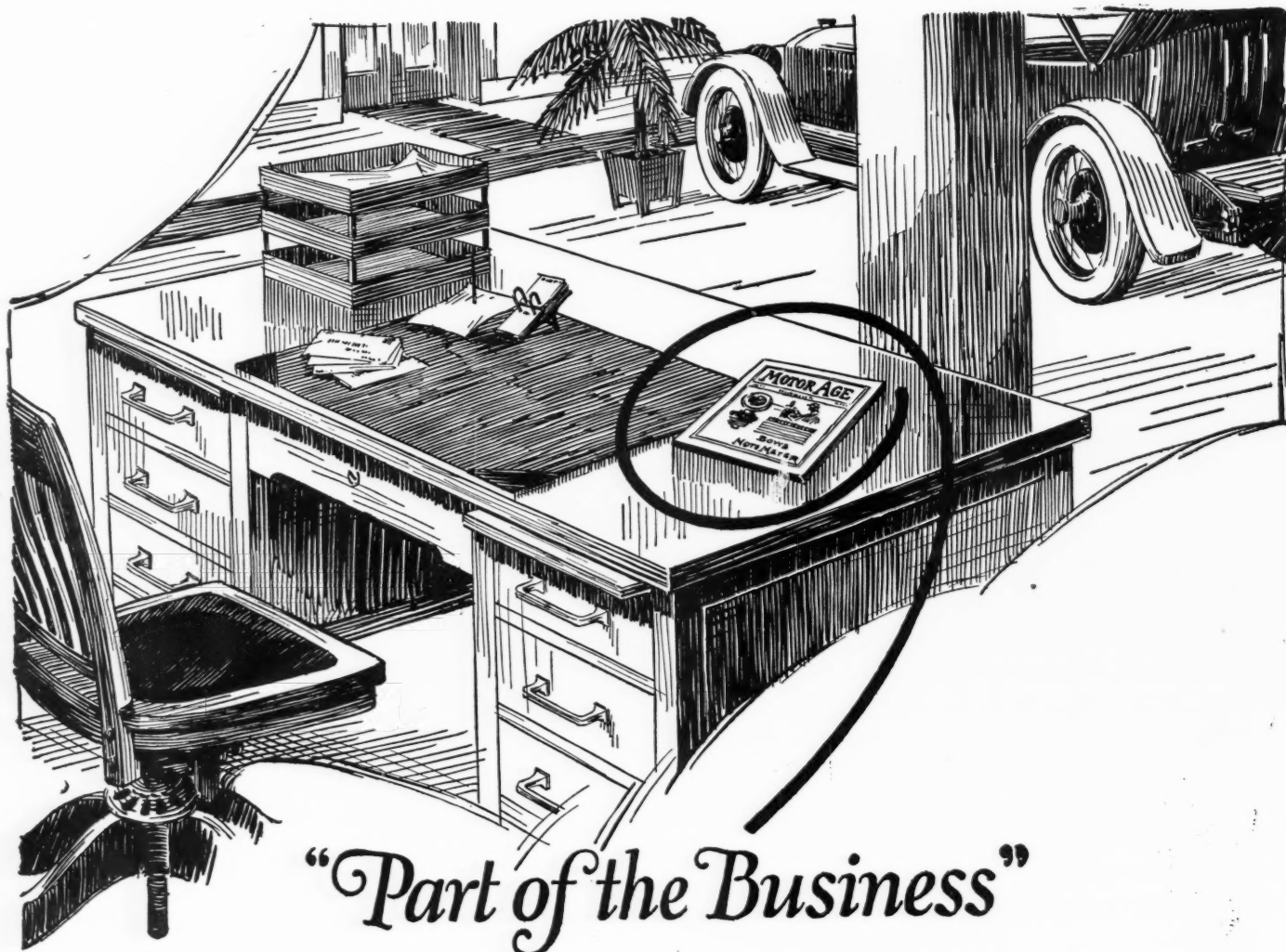
Chevrolet is the world's largest builder of cars with modern three-speed transmissions—a position won and being held by providing high quality at low cost.

CHEVROLET MOTOR COMPANY
DETROIT, MICHIGAN
Division of General Motors Corporation

for Economical Transportation



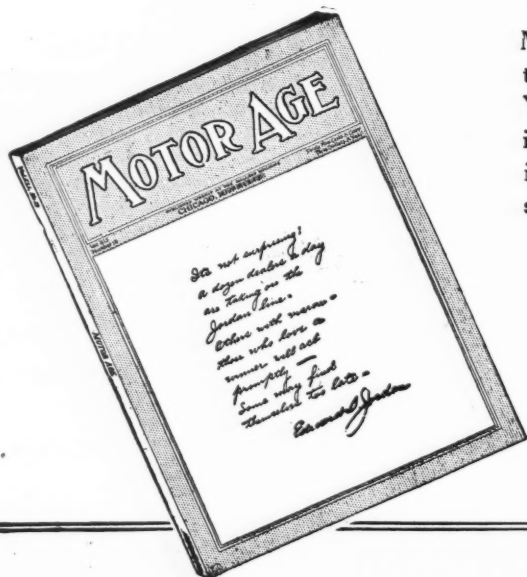
QUALITY AT LOW COST



"Part of the Business"

IF an automotive merchant could travel through the country asking hundreds of other automotive merchants about their methods of doing business—if he could find out why some businesses have failed and others prospered—if he could hear the personal stories of success from the acknowledged leaders of the automotive trade—if he could do this he would return home a far broader man and a more progressive dealer than when he started. His mind would be filled with new ideas. His enthusiasm would be kindled. And his business would reflect the valuable lessons learned.

MOTOR AGE is making such a trip possible to thousands of automotive merchants the world over. Yet these men need never leave their desks, for in its columns MOTOR AGE presents information of inestimable value gathered from every conceivable source.



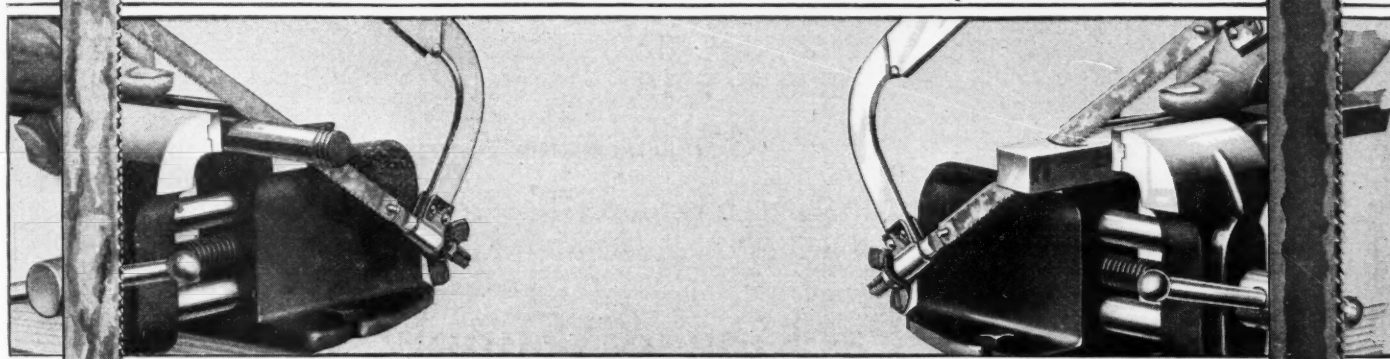
MOTOR AGE

5 S. Wabash Ave.

Chicago, Ill.

Are you using the right kind of HACK SAW BLADES?

THERE are Goodell-Pratt blades made for general all-around work, blades for jobs where there is severe twisting and side strains, blades for iron and steel, blades for brass or pipe, blades for soft metals, blades for thin steel sheets or tubing. Are you using the right kind of blades? Read this advertisement and find out.



No. 888

ALL-HARD Hack Saw Blades

Made from a high grade of hot rolled sheet steel .025 inch thick. Cut so that the length of blade runs with the grain. Teeth are cut, sharpened and set by a special process for speed in cutting. Hardened and tempered by another process which assures uniformity and long life.

These all-hard blades are for general work and are offered in lengths from 8 to 12 inches.

No. 777

FLEXIBLE Hack Saw Blades

These blades are for cutting under difficult conditions. Made to withstand severe twists and side strains without snapping.

Made from best hot rolled sheet steel with hardened teeth and back, *but with soft centers* for flexibility. The result is a fast-cutting, long-life blade that will stand up under severe strains.

Offered in lengths from 8 to 12 inches.

Pick the right Goodell-Pratt blade for the metal to be cut

For cutting iron and steel rods or bars, use blades with 14 teeth to the inch.
For cutting brass, tubing or pipe, use blades with 20 teeth to the inch.
For soft metals or light tubing, use blades with 24 teeth to the inch.
For thin steel sheets or tubing, use blades with 32 teeth to the inch.

Interesting catalog FREE

The Goodell-Pratt Catalog shows all the Goodell-Pratt hack saw blades, as well as frames and all the other 1500 Good Tools—many made especially for motor repair work. Write for a copy. It's free to you.

GOODELL-PRATT CO. *Toolsmiths* GREENFIELD, MASS.

Makers of Mr. Punch

GOODELL-PRATT

1500 GOOD TOOLS

Announcing a New Price List



on
TANPAC

Fibre Sheet Packing

.015 or 1/64	. . . . .	\$0.80
.020	. . . . .	1.20
.032 or 1/32	. . . . .	1.60
.0625 or 1/16	. . . . .	3.00

Our Discounts Remain the Same

Our volume on this popular product, has made the above reductions possible, in the face of advanced prices on most manufactured products.

Advance Packing & Supply Co.

808 Washington Blvd.

Chicago, Ill.

Pacific Coast Distributors: Allied Industries, Inc., Los Angeles, San Francisco, Portland and Seattle

*There are Profit Making Ideas
in Every Issue of*

MOTOR AGE

Many subscribers of MOTOR AGE, who realize the value of its contents each week, route every issue regularly through their places of business to all departments.

As a means of business-building this is a profitable habit to encourage, both for the benefit of the organization and its individual members. It is always best to read MOTOR AGE every week.

MOTOR AGE

5 SO. WABASH AVE.

CHICAGO, ILL.



HERE'S part of the No. 19 Ford LAPS system at the Hubbell Auto Sales Co., Bay City, Michigan. Notice the neat appearance of the steel bins, the systematic storage of parts, and the convenient arrangement for quick service. Also note visual check on parts in stock. If you see 'em, they're there. If not, you re-order.

Save time and space with these parts systems

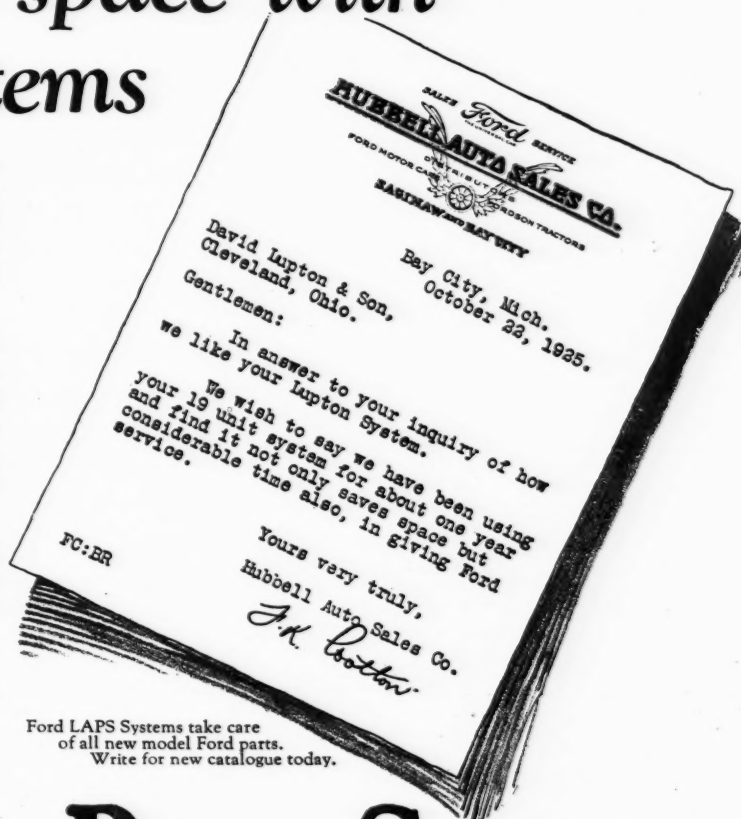
TO make money in parts these days, you have to save time and space in the parts department. And you have to give rapid, sure service to build up a profitable business. Your modern customer won't wait while you hunt through a confusion of bulky bins for the item he wants.

That's why successful dealers, accessory men, and shops have installed LAPS systems. These steel systems keep all the parts at your fingertips—in logical order, and with the minimum use of floor area. They permit snappy service to mechanic or driver and, at the same time, release valuable space for your display room, office, or other departments.

Many a dealer has increased his parts business 50% by installing a LAPS system. Could you use this extra profit? If you could, write today for "Better Parts and Accessories Merchandising."

DAVID LUPTON'S SONS CO.
Philadelphia

Sales Office—2631 Woodward Ave., Detroit, Mich.
Sole Manufacturers of Lupton Auto Parts Storage Systems



Ford LAPS Systems take care of all new model Ford parts. Write for new catalogue today.

LUPTON AUTO PARTS STORAGE



MORRISON


Automatic Double Range
Worm Drive
JACKS

Special model
for Balloons

Can't Slip or Tilt

Flexible steel "Sure Hold" cap prevents dangerous slipping. Long folding handle (36 to 72 in.) operates from standing position. Gets under overhanging bodies. Easy to work. Few turns and it's up. Built in 11 sizes for all service requirements up to 8 tons. Furnished as standard equipment on fine passenger cars, trucks, buses and Fire Apparatus for past 4 years. The Jack for YOUR shop. Write for sample for test.

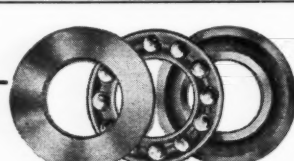
THE WOODS ENGINEERING CO., Alliance, Ohio



FULLBACKS look good on every sort of car — \$14 to \$25

The dealer receives New Era bumpers carefully wrapped, securely cartoned and—ready. Saves him a lot of time!

NEW ERA SPRING & SPECIALTY CO., GRAND RAPIDS, MICH.



THE BEARINGS COMPANY OF AMERICA

Lancaster, Penna.

Manufacturers of Angular Contact Thrust Bearings, Angular Contact Radial Bearings, and Thrust Ball Bearings of all types.

Supplied to your blueprints and exact requirements.

Western Sales Office
1012 Ford Bldg.
Detroit, Mich.

THE B & R 5

There Are Good Profits in
Battery-Charging

THIS BURTON & ROGERS 5 BATTERY CHARGER

is designed especially for
THE CAR DEALER

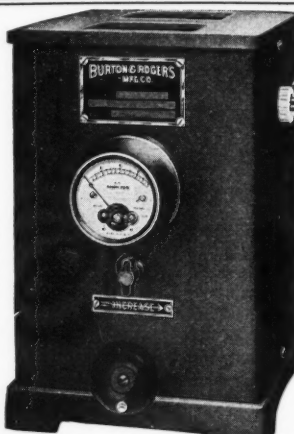
FLEET-OWNER BUS-TERMINAL
SERVICE GARAGE ACCESSORY STORE
RADIO DEALER COUNTRY GARAGE

to use in starting the charging-business. B & R 5 Battery Chargers have paid for themselves in 2 to 3 months. NO POWER LINE REQUIRED. Plug in on any 110-volt socket and set it to work. We make larger chargers too.

Send for our Charger Booklet.

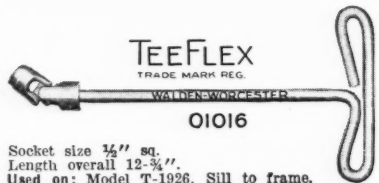
BURTON & ROGERS
MFG. CO.

755 Boylston St. Boston, Mass.



Definite Purpose Socket Wrenches


FOR
FORD
CARS
1926
MODELS



TEEFLEX
TRADE MARK REG.
WALDEN-WORCESTER
OIOI6

ASK
YOUR
JOBBER

Socket size $\frac{3}{4}$ " sq.
Length overall 12- $\frac{3}{4}$ ".
Used on: Model T-1926. Sill to frame.



WALDEN-WORCESTER
INCORPORATED
475 SHREWSBURY ST.
WORCESTER, MASS.

FOLLETT'S NEW MODEL TIME STAMP

accounts for every labor minute

Prints the year, month, day, hour, minute, A.M. or P.M. at the exact moment the plunger is pressed—like this, for example:

NOV 19 1920 4 31 PM

Tells when a job is started—and when it is finished. There can be no dispute over the time charge.

Absolutely automatic—except for winding. Every machine guaranteed.

Learn the interesting details from our descriptive data.

Follett Time Recording Co., 217 High Street, Newark, N. J.
"Established Since 1904"



BOLTS BLUE PRINT BUSHINGS

"Made to Blue Print"

"Bp" guarantees to the Replacement Trade the same high standard of Quality and Accuracy demanded by the car manufacturer.

The Fostoria Screw Co., Fostoria, Ohio

PROTECTOMOTOR 99 $\frac{9}{10}$


REG. U.S. PAT. OFF.
Perfect Positive Protection

Filters all dust, sand and grit out of air supply to carburetor and motor. Write us for facts.

STAYNEW FILTER CORPORATION
Rochester, N. Y.

EFFICIENT

INSURES A TOW HOME



BASLINE AUTOWLINE

E-196



Two Sizes FOR Ford AND Dodge Brothers Motors

Stops Vibration!

The SURE-MIKE COUNTER-BALANCED CRANK SHAFT replaces any Ford or Dodge shaft without change in motor or bearings. Guaranteed interchangeable. Makes an amazing difference in way motor performs. No vibration period. Insures smooth, quiet, vibrationless performance at all speeds.

“Six” cylinder results at all speeds!

A QUALITY SHAFT in every respect. Patented design. Drop forged in one piece. Beautifully machined and finished in world's largest crank shaft plant. Two types for both Ford and Dodge: “Regular” for splash oiling; “Drilled” for force feed oiling system. Approximate weights: Ford 22½ lbs., Dodge 50 lbs. Every owner wants one. A necessity for Ford racers. Write for literature and prices.

Dealers make money installing Sure-Mike Counter-balanced Crank Shafts. Attractive discounts. Write for name of nearest Jobber.

J. WADSWORTH STAFF
213 North Hamilton St. SAGINAW, W.S., MICHIGAN

SURE MIKE
REG. U.S. PAT. OFF.
COUNTER-BALANCED CRANK SHAFT



There's Good Will In Every KLEENKAR Shop Cover

The biggest factor for greater profits in your business is customer satisfaction.

And every time you use a KLEENKAR Shop Cover you make a better friend. Good will pays.

Write for samples and free courtesy tags.

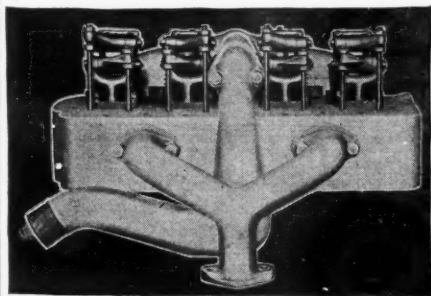


AUTOMOTIVE FABRIC EQUIPMENT COMPANY
Originators 235 East Water St., Milwaukee, Wis.

ROOF 16 OVERHEAD VALVE EQUIPMENT
For Ford and Dodge Motors
ROOF 8 VALVE HEAD FOR FORD MOTOR

Stupendous Power—Lightning Speed

Ford racing cars with Roof Equipment are rivals on mile and one half mile tracks of the highest priced racing cars. Doubles the pulling power of the Ford or Dodge pleasure car or truck. Hill climbing and general road work beyond wildest dreams of the owner. Complete—ready for installation—no machine work necessary. We are headquarters for all speed equipment. No matter what you want, write us. Racing quality—lowest prices. A postal card brings you complete list of our specialties.



Jobbers—Dealers—Consumers—Write Us.
THE LAUREL MOTORS CORPORATION, ANDERSON, INDIANA



Up and At This Armature Profit!

Send for the Fredericks price list. Plan to get in on armature rewinding profits now. Frederick's new low rates have made this business still more desirable. Write us for the booklet.

FORD GENERATOR Armatures Rewound	\$1.50
FORD Starter Armatures Rewound	1.50
ALL OTHER TYPES TWO-UNIT Generator Armatures Rewound	3.25
ALL OTHER TYPES TWO-UNIT Starter Armatures Rewound	3.25
ALL TYPES MOTOR GENERATOR Armatures Rewound	8.00

GUARANTEED to give the same satisfaction as new armatures.

The H. M. FREDERICKS CO., Lock Haven, Pa.

FREDERICKS
Rewinding Service

A Continued Story of the Industry

READING MOTOR AGE every week is very much like following the growth of the automotive industry in story form.

It is as interesting as a fiction serial, and instructive to the point of making better and more prosperous dealers.

Reading MOTOR AGE every week when it comes, assures subscribers that they will stay up to date and profit accordingly.

MOTOR AGE

5 So. Wabash Ave.

Chicago, Ill.

GOODRICH-LENHART PRODUCTS Cable

Starting - Lighting - Ignition

THE GOODRICH-LENHART MFG. CO., Hamburg, Pa.

Goodrich Cable is sold in lengths found to be the most popular with the average buyer—coils of 100 ft. packed in individual cartons. Both shop men and car owners like the clean 100 ft. package idea—and this leads to quick and profitable sales.

Send for samples, prices and discounts.



DIERINGER BUSHING REMOVER

Any spindle bushing out in two minutes! Merely insert tool, drive out with hammer. Full set of 3 sizes covers all cars. \$4.50. Write for trade discount. Distributors wanted. E. T. Dieringer, Box 282, Bolivar, O.

FISK TIRES

There's a Fisk Tire of extra value in every size, for car, truck or speed wagon



PROTEX TIRE CHAINS

Protex Chain Co., Inc.
Waynesboro, Pa.

Absolutely Stop Skid

Many small horseshoes grip the road and prevent slip. The first scientific anti-skid device.

Kawneer

SOLID COPPER

STORE FRONTS

Write for Special Book Garage Front

THE KAWNEER CO., 3124 Front St., Niles, Mich.



More
Power
Less
Fuel

Zenith - Detroit Corporation, Detroit, Mich.

Transmissions
and Clutches



Trucks, Busses
Passenger Cars

QUICK SERVICE ON COMPLETE UNITS OR PARTS

BROWN-LIPE GEAR CO.

SYRACUSE, N. Y.

Gemco BUMPERS

Tempered and nickel plated by our own exclusive process. Maximum strength, lasting beauty of finish. Write for catalog. 760 S. Pierce St. Milwaukee, Wis.



"As Silent as a Shadow" Quincy Compressors Quincy, Illinois

J-538



They Won't Come Back

Those jobs won't come back showing oil passing, compression loss and crank-case dilution if you use a Hall Hone. The Hall makes cylinders both round and parallel. Ask your jobber.

THE HALL MFG. COMPANY
512 Hall Bldg., 1600-06 Woodland Ave.
Toledo, Ohio



Fine Fours, Sixes and Eights-In-Line

LYCOMING MFG. CO.

WILLIAMSPORT, PA.



UNITED STATES Portable Electric DRILLS

Built by the oldest maker of Portable Electric Drills in the World.

Ask for
Catalog 106

THE UNITED STATES ELECTRICAL TOOL CO.
Cincinnati, Ohio, U. S. A.

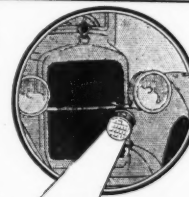
THE WALDEN FORE-LITE

Mounted ahead of the radiator and operated like a spotlight from the instrument board, the WALDEN Fore-Lite satisfies a need hitherto filled by make-shifts. Universal fittings. Selling fast wherever introduced. Ask your jobber, or write us direct, giving his name.

THE WALDEN CO.

1114 S. Michigan Ave.

Chicago



Curtis Pneumatic
Machinery Co.

1527 Kienlen Ave.
St. Louis, Mo.

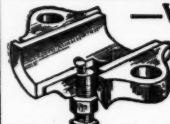
Cushers

The Modern Spring Rebound Controls—Fast—Noiseless

Manufacturers: CHICAGO ROLLER SKATE CO., CHICAGO
Cushers Sales Dept., Fulton-Dean Co., 332 S. Michigan, Chicago

TAKE THE END-PLAY OUT!

—WITHOUT PULLING THE MOTOR



The C. A. ADJUSTABLE CENTER BEARING CAP corrects Ford crankshaft end play and sets magneto for highest efficiency without removing the motor. Easily and quickly installed. Guaranteed for one year. List price \$3.75. Ask your jobber or dealer or write us direct.

ADJUSTABLE BEARING CO., Inc.

Pat'd 7-22-'22

Dept. M.

Brazil, Indiana

R.I.V. Means Quality
in Every Language



250 West 57th St.

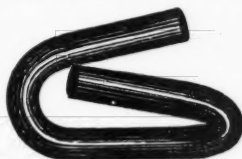
New York City

NO TOOLS—It's Self-Closing

Repair Link for Broken Cross
Chains

A Self-Closing Monkey Link attached with
fingers to loose ends of broken chain closes
and locks on first turn of wheel. Stops
clanking—saves fender—low-priced. Box of 10
Links retails for 25 cents.

Write for samples and discounts.
Distributors wanted.
FLOWER CITY SPECIALTY CO.
Rochester, N. Y.



Valve Face Grinding Machine

Before you buy any valve grinding machine it will pay you to investigate
the "Sioux." Nothing like it!

Ask Your Jobber About It.

Albertson & Co.

Sioux City, Iowa

QUALITY—PROFIT—TURNOVER

**American
Hammered
Piston Rings**

American Hammered Piston Ring Company
Baltimore, Maryland



To beat the water meter— GAYLORD

WATER SAVING DEVICES

Sales Office
A. K. TROUT CO., Inc.
342 Madison Ave., New York, N. Y.

Factory
GAYLORD MFG. CO.
Paterson, N. J.

HIGH LUSTRE FINISH

For Everything Varnished or Enameled
Automobiles, Pianos, Furniture
Recommended for DUCO

H. L. FEASEL'S LABORATORY

9-11-13 Desbrosses St., New York, N. Y.



Rubber Tubing for the Trade

EKLA radiator hose—All-Rubber or Cloth-
Inserted, tire pump hose and windshield
wiper tubing, all in standard lengths, will
show you better profits and your custom-
ers better service.

Insist on EKLA Brands when buying
these items.
THE ECLAT RUBBER COMPANY
Cuyahoga Falls, Ohio



A KLEAN-RITE Auto Laundry Fran-
chise Is a Big Money-Maker

Write for a copy of our booklet on "The Business
Possibilities of An Auto Laundry." It contains val-
uable information. Sent free upon request.

KLEAN-RITE AUTO LAUNDRY CO.
1710 E. 75th St., Chicago

KISSEL

CUSTOM BUILT

Kissel Motor Car Co., Hartford, Wis.

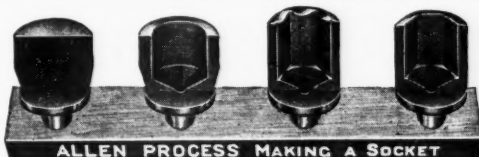
A Word to the Dealer Who Has Never Handled Radio Equipment

WE offer you exclusive territory and a permanent business. We start you with
a complete set at a price that beats competition, and the opportunity
exclusively to handle the products of the foremost radio designer of the day.
Get in touch with your Jobber at once—or wire Sales Department, giving his
name and address.

MODERNOLA COMPANY, Inc., Johnstown, Pa.

DELANO RADIO

Cold-
Drawn
Sockets



ALLEN
Wrench
Sets

The Allen Manufacturing Company, Hartford, Conn.

TASCO

Gas Gauge for
FORD,
CHEVROLET and
OVERLAND

Sells Quick at
\$1.25
Retail



THE AKRON-SELLE CO.
Akron, Ohio

CLASSIFIED ADVERTISING

PARTS

HOUSE OF A MILLION AUTO PARTS

The largest stock of new and used car and truck
parts in the world. We have everything. Always
mention model and serial number in order. Write
us. All inquiries answered promptly.

DOUGLAS AUTO PARTS CO., INC.

2003-5-7-9 South State St., Chicago, Ill.

PARTS

AUTO PARTS

SAVES 50% TO 75% ON ALL CARS
New and Used Gears—Springs and Axles—Cylinders—
Motors—Rear Systems, etc. Wire or Write

INDIANA AUTO PARTS CO.

608-10 N. CAPITOL AVE., INDIANAPOLIS, IND.

LARGEST CAR WRECKERS IN INDIANA

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FOR SALE—Automobile business and modern garage with
dwelling adjoining. Popular agency. Wonderful oppor-
tunity in thriving town. Center of hard roads. Address
Box 6256, Motor Age, 5 S. Wabash Ave., Chicago, Ill.

**snappy salesman
for you—**



**ask your jobber's salesman
about this counter display**

K EY Graphite Paste will sell itself to the car owner when he sees this instructive counter display. Lithographed in attractive colors and holding 8 quarter-pound cans. It takes up very little space and can be placed anywhere. Convenient sized card 13¼" by 10½".

Up-to-date repair men know all about Key Graphite Paste. For several years they have been using it when sealing all gaskets and screw-thread connections, or any place where it is essential to get an oil-tight or heat-proof connection.

The great multitude of car owners who do their own repair work will buy Key Graphite Paste, gladly.

If your distributor cannot supply you, send us his name with 10c to pay cost of mailing and we will send you a liberal size can for trial purposes.

KEY BOILER EQUIPMENT CO.

27th and McCasland Ave.
East St. Louis, Ill.

---Send for Trial Can---

Key Boiler Equipment Co.
27th and McCasland Ave., East St. Louis, Ill.

Enclosed find 10 cents for which please send me a trial can of Key Graphite Paste.

NAME

FIRM

ADDRESS

JOBBER'S NAME

M.A. 12-31-25

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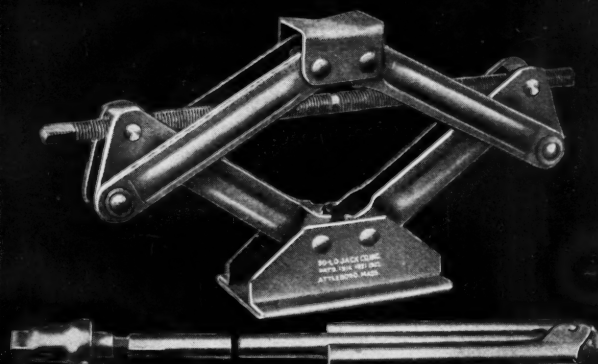
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Never Before a Jack Like This

The MASTER SO-LO^{PATENTED} Jack



—with a high-power lifting range
from 4³/₄ to 15¹/₂ inches

*The Master So-Lo Jack Fully
Solves the Balloon Tire Problem*

Heavy ALL-STEEL Construction

(Side Bars Channeled for super-strength)

Compound leverage takes the car up with start-
ling ease.

Folding-telescope handle extends to full 36
inches. Combined rigid-universal joint at
handle-end makes this the easiest of all jacks to
place under the car and to operate.

*Its unusual shape and handsome green enamel
"overcoat" make it a wonderful
display feature.*

Retails at \$6.00

(West of Mississippi \$6.50)

THE MASTER SO-LO JACK IS A SURE SELLER
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SO-LO JACK CO., Inc.
ATTLEBORO, MASSACHUSETTS

SALES OFFICE

537 Commonwealth Ave.

Boston, Mass.

Do You Read Our Editorials?

EVERY once in a while we discover a reader who goes through each issue of MOTOR AGE with great care, and yet manages never to read an editorial.

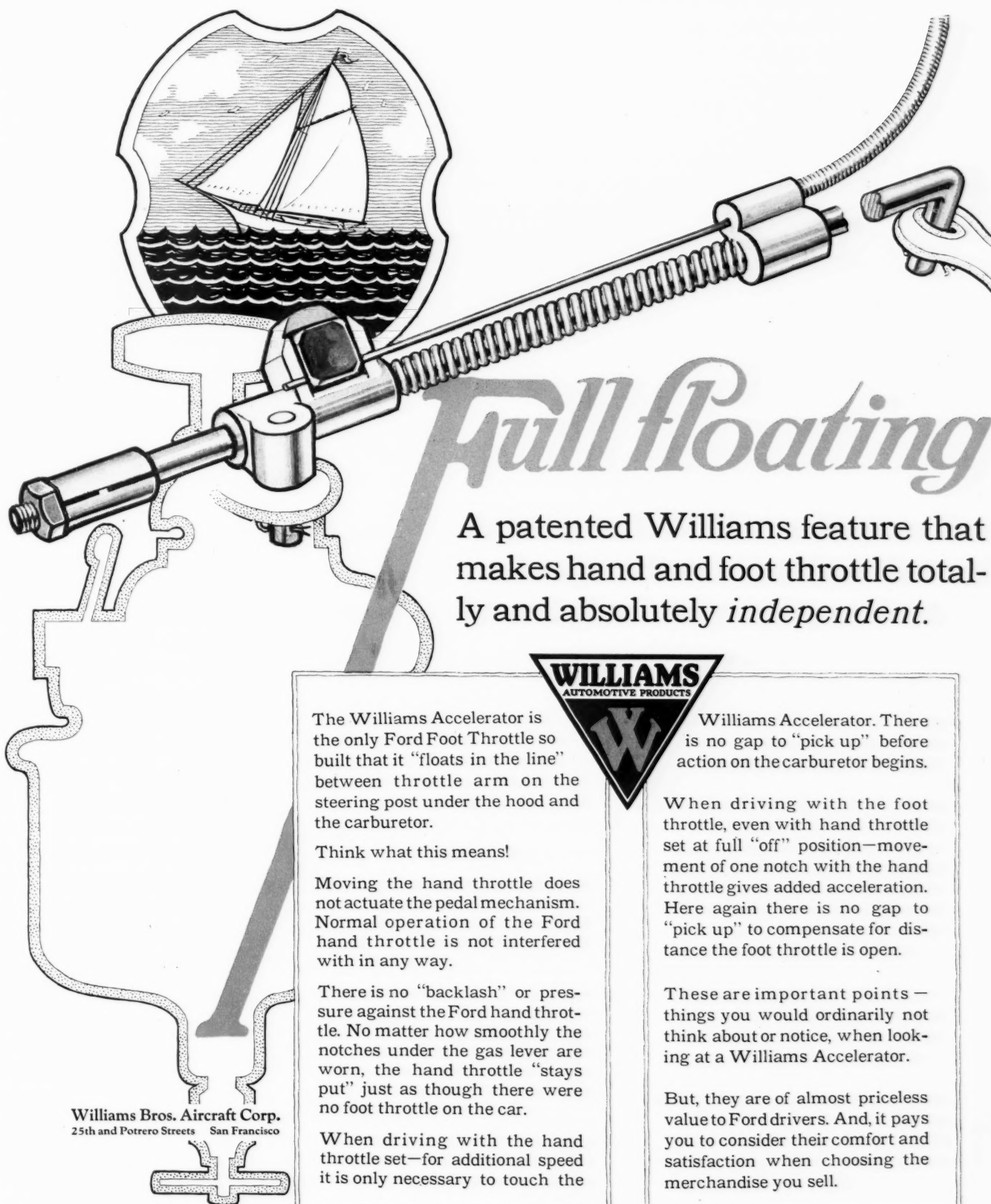
This raises the question, "Why is an editorial?" You may be quite certain editorials are not written just to fill space, for space in MOTOR AGE is too valuable a commodity to be used in that way. They are meant to be read, and read by just such people as the reader described. Because we believe that it is important that our editorials be read, we see that they are printed in rather large type, well displayed, and inviting to the eye.

Our editors are well informed men. They study their field—your field—continually. In the process they gain many impressions and form many opinions about the same things that occupy *your* mind when you consider the problems of your own business. They cannot afford to

be dogmatic about these things, nor make their conclusions the basis of authoritative articles, for they may be mistaken. But they can tell you what they think and why—they can pass on to you their personal opinions for you to match against your own. And it is in their editorials that they can do this.

If you could drop into our office once a week for an informal talk with our editors, you would probably gain much by getting their slant on the various controversial questions that you, as a member of the trade, are deciding or helping to decide. By the same token you can gain much by reading our weekly editorials, for it is just here that our editors do talk to you informally, and tell you what they are thinking of on a host of subjects intimately related to your business.

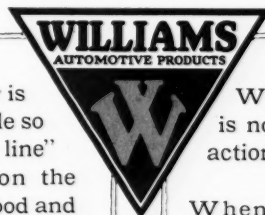
Turn to our editorial page, and see if you don't agree.



Williams Bros. Aircraft Corp.
25th and Potrero Streets San Francisco

Full floating

A patented Williams feature that makes hand and foot throttle totally and absolutely *independent*.



The Williams Accelerator is the only Ford Foot Throttle so built that it "floats in the line" between throttle arm on the steering post under the hood and the carburetor.

Think what this means!

Moving the hand throttle does not actuate the pedal mechanism. Normal operation of the Ford hand throttle is not interfered with in any way.

There is no "backlash" or pressure against the Ford hand throttle. No matter how smoothly the notches under the gas lever are worn, the hand throttle "stays put" just as though there were no foot throttle on the car.

When driving with the hand throttle set—for additional speed it is only necessary to touch the

Williams Accelerator. There is no gap to "pick up" before action on the carburetor begins.

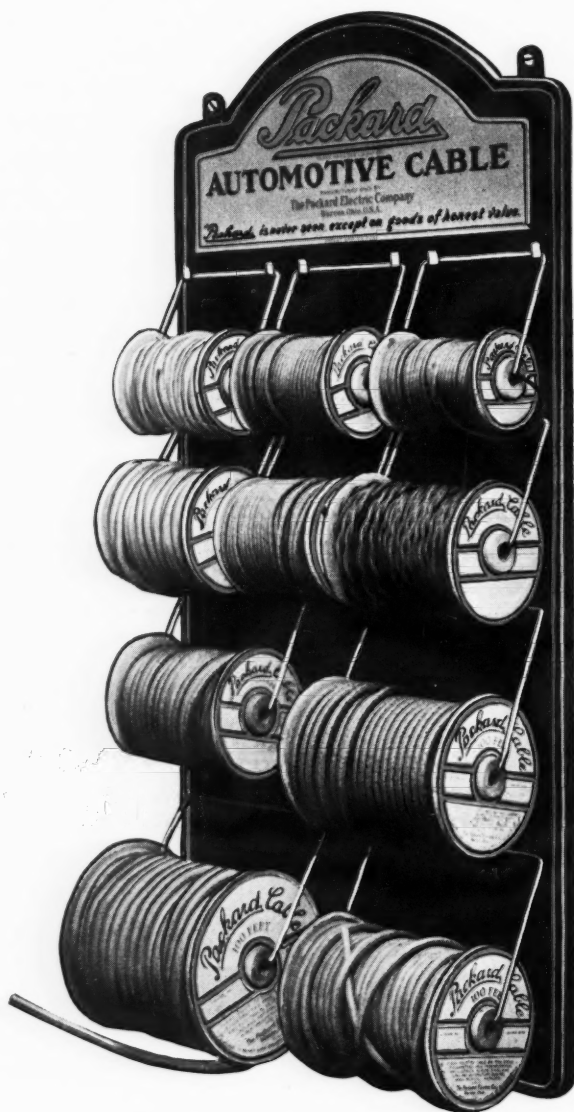
When driving with the foot throttle, even with hand throttle set at full "off" position—movement of one notch with the hand throttle gives added acceleration. Here again there is no gap to "pick up" to compensate for distance the foot throttle is open.

These are important points—things you would ordinarily not think about or notice, when looking at a Williams Accelerator.

But, they are of almost priceless value to Ford drivers. And, it pays you to consider their comfort and satisfaction when choosing the merchandise you sell.

WILLIAMS

ACCELERATORS FOR FORDS



The Packard Cable Merchandiser as it appears ready for use.

The Packard Merchandiser

The biggest step ever taken to make a profitable merchandising line of automotive cable.

The Packard Cable Merchandiser together with ten 100-foot spools of Packard Cable, of different types is shipped complete in a neat container which also includes an instruction card—list price schedule—a handsome display card—and a Packard Wiring Chart. This Wiring Chart shows by trade number the proper cable for every requirement on all American made Automobiles and trucks.

Assortment A or assortment B will take care of any car on the road. Special assortments can be made up where necessary—AND all for the price of the cable.

Ask any representative of the more than 400 Packard Jobbers for the complete story, or should you prefer, write us direct.

THE PACKARD ELECTRIC CO., Warren, Ohio

Packard is never seen, except on goods of honest value

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